LAUREA
UNIVERSITY OF APPLIED SCIENCES
Together we are stronger

IT Service Management Service Design and Implementation with the SAP Solution Manager

Le Quang Duy

2016 Unit

Laurea University of Applied Sciences
Laurea Leppävaara

IT Service Management Service Design and Implementation with SAP Solution Manager

Le Quang Duy
Degree Programme in Business Information Technology
Bachelor's Thesis
July, 2016

Laurea University of Applied Sciences **Abstract**
Degree Programme in Business Information Technology
Bachelor's Thesis

Le Quang Duy

IT Service Management Service Design and Implementation with SAP Solution Manager

Year 2016 Pages 83

This thesis is a functional thesis, based on a design and development project in BPS Consulting Finland Ltd. The main objective of the project was to identify, evaluate and implement a practical solution to improve the support services of BPS Consulting Finland Ltd. The chosen tool for implementing this solution is the IT Service Management component of the SAP Solution Manager system. Using the methods and toolsets of Service Design, as well as System Analysis and Design, the project team investigated the current support services of BPS Consulting Finland to determine opportunities for improvement and project requirements in order to design and deploy the proposed solution for the BPS Consulting Finland environment. System documentation, application testing, and user training are also in the scope of this project. The project was considered by BPS stakeholders to be successful because all major project requirements have been fulfilled, new solution has been deployed and tested, and all required documents have been finalized and distributed to BPS employees.

Keywords IT Service Management, Service Desk, Service Design, System Analysis and Design, Application Incident Management

Laurea-ammattikorkeakoulu **Tiivistelmä**
Laurea Leppävaara
Programme

Name(s)

IT Service Management Service Design and Implementation with SAP Solution Manager

Vuosi 2016 Sivumäärä 83

Finnish translation of the abstract begins here

Table of contents

1 Introduction

1.1 Project Case

BPS Consulting Finland Ltd. is an SAP Service Partner, working in cooperation with SAP AG. The company is a private company owned by the family. Furthermore, being a member of BPS Group, it collaborates with other enterprises in the international BPS Group network. The network comprises privately owned consulting businesses operating in European countries and specializing in SAP implementation, maintenance, programming, end-user training, customizing and basis consulting projects. To be more specific, besides BPS Consulting Finland, the BPS Group consists of BPS Germany, BPS UK, BPS Czech Republic, BPS Hungary, BPS Lithuania, BPS Estonia, and BPS Latvia. Operating in an international environment, the group has customers from different countries of the world.

According to the information provided on the company website (2014), BPS Consulting Finland Ltd., which was founded in 1998, are specialized in ERP strategy consulting and SAP services. Specifically, the company concentrates on four different key SAP areas, namely as SAP projects, SAP maintenance, SAP applications and SAP technical areas. The company name, BPS, is the abbreviation for Business – Process – System, which emphasizes the core competences of BPS in business development and management projects, especially ERP-related projects (from feasibility studies, design to the implementation of SAP systems).

In terms of SAP ERP systems, BPS Consulting Finland Ltd. is specialized in various ERP modules, such as Service Design (Sales and Distribution), MM (Material Management), WM (Warehouse Management), PP (Product Planning), PM (Plant Maintenance), FI (Finance), CO (Controlling), PS (Project System).

In addition to SAP ERP, BPS Consulting Finland also provides services for other SAP systems such as CRM (Customer Relationship Management), HCM (Human Capital Management), SRM (Supply Chain Management), SAP Solution Manager, and SAP BW (Business Information Warehouse).

Led by Marjariitta Wakkola, the company's CEO, BPS Consulting Finland currently has 7 employees working regularly in Finland with over 50 external consultants. In general, the company organizational structure includes the CEO, service team leads, SAP coordinators, SAP technical basis consultants, and back office service desk agents.

BPS Consulting Finland has conducted assignments for more than 140 Finnish SAP customers with 25 SAP projects and 18 constant service maintenance and regular customers. In 2012, the turnover of the company was estimated at approximately 1.2 million Euros.

1.2 Project Definition

Currently, there is a need to improve the customer support services provided by BPS Consulting Finland Ltd. to its customers. Therefore, the focus of this thesis is to identify, evaluate and implement a solution to improve the support services. The thesis works were performed as a two-phase project. During the first phase, the limitations of the current service were identified, and possible solutions were suggested with the intention to improve the efficiency of support processes and heighten the satisfaction level of BPS customers. Then in the second phase, the chosen solution was implemented and deployed in BPS environment.

Based on the aforementioned focus, the project was divided into four steps. Firstly, our project team members performed literature research and reviewed the current support services processes, Information Technology Service Management (ITSM), industry standards and practices such as Information Technology Infrastructure Library (ITIL). Secondly, some interviewing meetings were held to understand the support services and identify potential pain points for improvement. Thirdly, the new support model and processes were designed and sent to BPS managers for approval. After the assessment by BPS managers, the IT Service Management tools from SAP AG were chosen to be implemented. Lastly, the proposed solution was deployed and tested in BPS environment. Additionally, system documentation and user training are also parts of this project, lessons learned and possible improvements were identified and documented at the end of this project.

The newly implemented system is expected to provide a tool for BPS employees to manage customer incidents and service requests more easily and efficiently by providing an integrated tool for BPS Support, as well as to introduce new work processes and best practices for BPS employees. By improving and simplifying the current support services, the project aims to enhance the satisfaction level of BPS customers.

2 Project Approach

To implement our project, the tools and methods of System Analysis and Design, as well as Service Design were used a referenced framework to structure and develop the project. Accordingly, System Analysis and Service Design were performed first to determine the

current situation, gather requirements and design the “TO-BE” services. The Service Design – Practical Access to an Evolving Field guideline by Stefan Moritz (2005) was used as the guidelines for this phase. Subsequently, system design tasks were performed to design the system architecture and user interface. Finally, the solution was implemented, deployed and tested in BPS environment. Future possible improvement and lessons learned were documented at the end of the project.

Various deliverables were produced during the project, including, for example, problem statement, requirement specification, processes and system models, service blueprint, prototypes, training materials etc. The ultimate outcome is the implementation of the new system in BPS environment, new processes and work practices are introduced for BPS employees with detailed system manuals.

2.1 Service Investigation

Firstly, based on the project objectives, we determined the service users, the service provider (in this case, BPS Consulting Finland Ltd.), the service context, and available project resources in order to identify potential possibilities for improvement, as well as possible challenges that may hinder the project success. Later in the project, we discussed and agreed on a proper direction and approaches which would be suitable for BPS Consulting Finland Ltd.

To be more specific, we investigated about the customer needs, wants, motivations and their requirements, paying attention to the way stakeholders using the support service of BPS Consulting Finland Ltd. Regarding the support service context, BPS Consulting Finland Ltd. plays the role of both service provider and users of the proposed solution. Therefore, to gather information about BPS service team and its clients, as well as to identify possible opportunities for improvement, our team interviewed BPS employees and observed their working processes.

Because the service is complicated and no one in our project team had previous experience in the new system, we had to spend a great amount of time investigating the support process and the SAP Solution Manager System by some books and on the SAP’s websites (SAP Service Marketplace). Particularly, we had to acquire knowledge about IT Service Management, service support processes, and industry standards such as ITIL as well. We also need to read additional online materials about Service Design tools in order to use those tools efficiently.

Furthermore, to understand the service context, besides reading books and online materials about current trends and competition, our team and BPS Consulting Finland Ltd. employees

discussed and identified some project requirements and constraints, concerning both business and technical points of view. In addition, in order to understand how the current support services were performed, employees from different service teams were brought together to discuss the issues of the current service.

As I had two job placement periods in BPS Consulting Finland Ltd., and is also an employee of the company, I had the chance to work in the support processes and observe other employees performing their tasks. During the observation, I saw the support service in action, processes and systems used by BPS's employees. By observing other BPS employees, especially the service desk agents, our project team identified some drawbacks of the current service as well as some challenges that the service desk agent faced while doing their tasks. One example of those challenges is the support service messages between customers and the support staffs are only stored in emails, and sometimes documented in Word documents. The downside of this approach is that those messages cannot be found fast and easily enough, especially for other BPS employees who did not work with the message before. Subsequently, when the other employees need to search for the documentation of the reported incident (for example, when similar incidents occur), it usually takes lots of time and effort to search all the emails and asks for information from the previous incident processors. Another example is the outdated instructions for systems monitoring, which is not stored in a central shared location where every employee involving in the support service can access when needed. In general, one of the most important findings is realizing that the problems usually occur not only because of technologies, but due to the inefficiency of business processes as well.

In general, the main goal of those activities is to identify the areas that the company and the project should aim for, which are relevant, appropriate, and based on the actual requirements of BPS Consulting Finland Ltd. Furthermore, we can also verify our assumptions and interpretation we got before the actual interaction with the project stakeholders.

2.2 Brainstorming Sessions

During the project, our project team conducted some brainstorming sessions to developed ideas for other more specific issues, such as how should we document and distribute system monitoring instruction documents; or which business process steps can be automated with SAP ITSM Application.

Our team arranged a brainstorming session with BPS employees to discover various ideas and opinion about projects. During the session, we asked employees to identify the weakness of the current system, possible improvement possibilities, possible challenges to our projects

considering various aspects and constraints. Moreover, by conducting the brainstorming session, we hoped to involve BPS's employees with different background and diverse experience, as well as to build up the relationship among the project's stakeholders.

Because there are various constraints we need to consider, our team decided to use some frameworks as the foundation for our brainstorming session to target our session on useful essential issues. One of the tools we used as a basis for conducting the brainstorming workshop is CATWOE, which helps us to target the issues related to Customers, Actors, Transformation process, and World View, Owner, and Environmental constraints. To be more specific, based on CATWOE, we prepared some questions to steer the brainstorming discussion and guide the attendees focusing the discussion on relevant topics.

In total, the session had six participants from different service teams. Utilizing the Focus Group technique, we divided the participants into two groups, namely as Team Lead Group, and Business Specialist Group, with five members including our team members. Because these two groups have different requirements, perspectives, and level of understanding, we believe that it will be more valuable and cost-effective to separate the two groups and discuss with each group separately.

Before the actual session, our team prepared the meeting agenda and planned the session in advance. Because employees may not be motivated to participate actively in the meeting, so if we did not prepare probably, the session might bring no real value, or even worst, be costly to the BPS Consulting Ltd. (because the session occurred during the working hours that the company paid for employees). After the agenda was ready, we sent it to all participants so that they could prepare before the brain-storming session.

We appointed one team member to record the ideas and another was responsible for guiding the session. Before the actual session, our team members also did the individual brainstorming ourselves so that we got our own ideas recorded, and therefore, only needed to focus on developing ideas from other participants.

The brainstorming session was held in BPS's meeting room, isolated from the working area so that participants could concentrate on their discussion without getting distracted. We set up the meeting room and prepared the required equipment, including A4 paper sheets and sticky notes. We also printed out the agenda and delivered to participants.

Because attendees were used to work with each other, we did not need warm-up activities. We then started the session by introducing the topic and the objectives of the session (what we want to achieve from the brainstorming session). After that, we also informed and

convinced attendees not to criticizing or judge other ideas but to generate as many ideas as possible, and convinced them that there would be no dummy idea and we needed to explore all the possibilities. Any analysis and evaluation of the ideas would need postponing at the end of the brainstorming session.

In order to avoid unhelpful group thinking behaviors, and ensure that all ideas are developed fully, our team decided to combine both individual and group brainstorming methods. Firstly, we started the brainstorming session by having attendees brainstormed individually, and subsequently, discussed the ideas generated in the group to develop them further. In short, by combining individual and group brainstorming, we hoped to maximize the number of ideas that we could generate.

During the brainstorming session, we prepared some questions and presented in PowerPoint slides (each question reside on a slide so that we can focus on one question at a time). We provided each attendee with an empty A4 paper sheet, after having read the questions, the participant answered each question on the paper sheet, we also told them to write down any ideas they come up when answering questions and we can discuss about the idea later. The questions were given to attendees in this section are quite general, focusing on broad issue so that we wanted to encourage them to think about the topic as much as possible, from different perspectives. We believed that doing this will help us to generate as many ideas as possible while still focusing on our objectives.

Having a list of ideas in each attendee's paper sheet, we used the list as the basis for widening our discussion in a group. Group brainstorming, in our belief, can help us involve all members of the group to thoroughly discuss each idea, expand the idea, and develop it in greater depth thanks to the full experiences and creativity of all team members. Furthermore, we believe that team members can help each other to develop ideas so that when a member get stuck with an idea, another member's creativity and experiences can take the idea to the next stage. Lastly, group brainstorming, in our beliefs, can be a great way to build up working for team, and develop stakeholder's relationships. However, as being previously mentioned, one drawback of group brainstorming is group thinking, in which group member may pay so much attention to other people that they don't generate ideas while they wait for their turn to speak (may blocks others' ideas. Therefore, we needed leading and controlling the session tightly so that the group does not crush these ideas and stifle creativity.

We then come back once again with the questions, but this time, discussed about the topic openly in the group. We asked each attendee the questions once again, started with a specific person and circulated to other members. Each idea was noted down on a sticky note

so that everyone can see, discuss, and comment on the idea. The expanded ideas related to that idea will be written on other stickers and we tried to continue expanding the ideas until all ideas were exhausted. After finishing with one person, we then asked the next person about the same question, repeat the process until all members answer the given question. After finishing one question, we then asked next questions until all questions were revisited.

During the session, our team also added some ideas of our own and steered the further discussion. All the ideas collected during the brainstorming session were later evaluated, filtered and summarized.

Because there were lots of ideas and solutions proposed during brainstorming session, we tried to group those ideas and solutions to clusters, and organized them with mind-maps (Appendix 1). To be more specific, after all ideas were collected and written on the sticker notes, we started to discuss and arranged the ideas logically. We did this by first sorted and accumulated the stickers that are related in specific areas, then arranged the ideas in a mind map. In order to select the most relevant ideas, our team discussed and agreed on the selection criteria with the BPS Consulting Finland Ltd.'s service managers, who were the key decision makers for our project.

2.3 SWOT Analysis

The SWOT analysis forms that our team had prepared were sent to all meetings participants so that they can fill and send back to us before an agreed day. The main objective of our SWOT analysis is to ask the project stakeholders to assess the strengths, weaknesses, opportunities and threats of the current (AS-IS) and the future (TO-BE) services. Before distributing the SWOT form, our team informed the meeting participants about the purpose of our SWOT analysis, expected outcomes, and then guided them how to complete the form. The summary of our SWOT analysis is included in Appendix 2 of this thesis.

Based on the insights obtained by interviewing BPS Consulting Finland Ltd.'s support staff and performing SWOT analysis of the support service, we performed a service usability check by evaluating the usability of the current service and communication systems. The main objective of the usability check is to discover the usability problems, some challenges, that support staff and customers faced with the current service, as well as the reasons for such difficulties. By identifying the strength and weakness of the current service, our team continued to explore what can be improved in the support service. Accordingly, two main drawbacks of the current service, which were identified after the service usability check, are

associated with the lack of up-to-date system monitoring instruction documents and a tool to manage customers' support messages automatically and consistently.

2.4 Service Realization

In order to enable common understanding among the project team members, some artifacts such as process models, customer journey maps and service blueprints were produced to explain, visualize and discuss about the future scenarios. In addition, during and after the implementation of the future service, we prepared the guidelines to implementation team and training materials to BPS Consulting Finland Ltd.'s support staff.

3 Project Management

Because there were lots of tasks to performed during our project, our project team decided to group different tasks to different main phases and produce Work Breakdown Structure (WBS), then to prepare a project plan to manage the project progress.

3.1 Work Breakdown Structure

The project was split into four main phases, namely as Project Initiation, Project Planning, Project Implementation, and Project Delivery. Each project phase consists of different work packages, as being depicted in the following WBS (Figure 1):

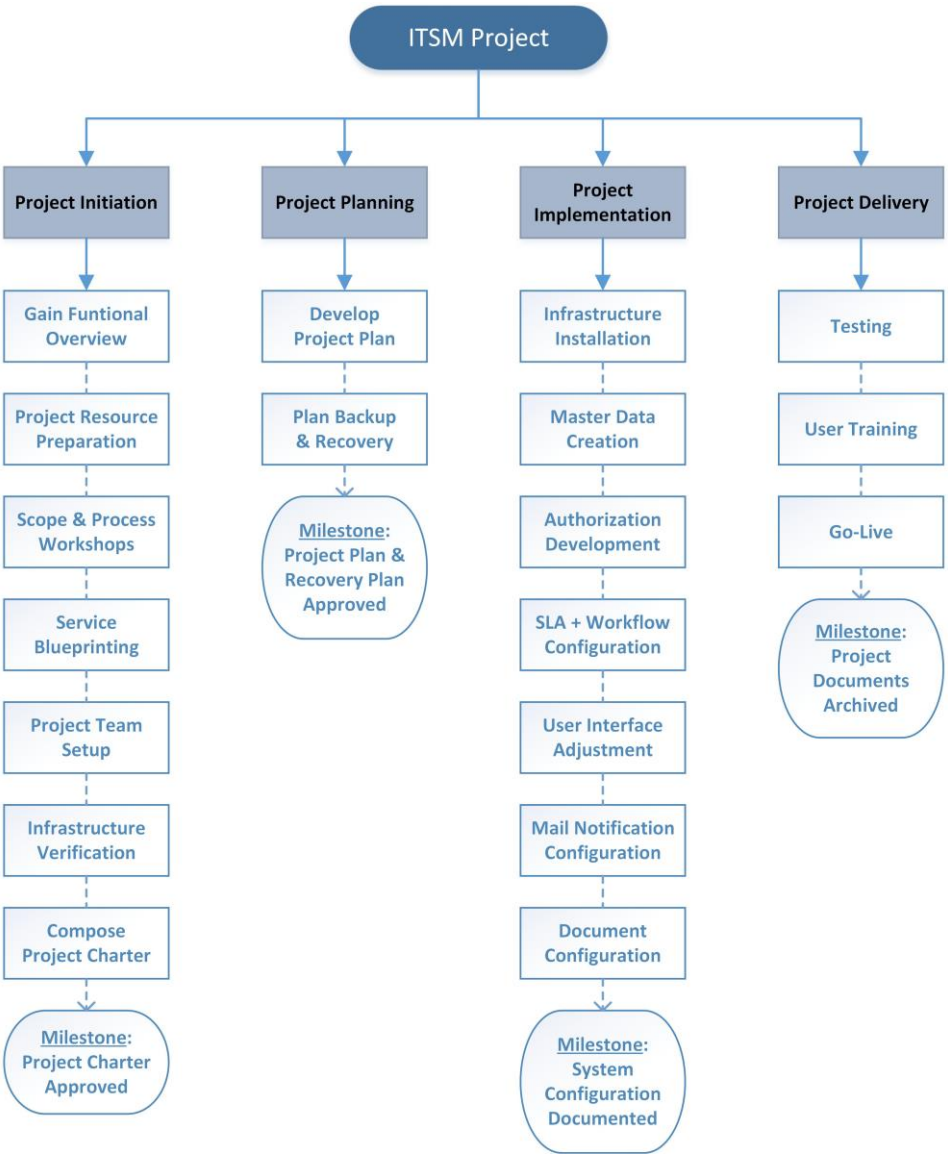


Figure 1: Project Work Breakdown Structure

At the beginning, an overview of the basic functionalities of SAP Solution Manager needs obtaining to understand the possibilities, processes and advantages of ITSM tool. Thereafter, many meetings were held to determine whether we have access to necessary resources including both internal resources and external resources (i.e., implementation and hosting partners, SAP AG…) to implement the solution. In addition, available hardware and software were checked to decide if additional hardware/software need to be procured or not. Throughout the project, various workshops were conducted to clarify the functional and non-functional requirements, to estimate effort for development, and to define implementation scope. Subsequently, the service blueprints of the current and future situation are drafted, all related business processes are modeled. At the end of this phase, the project team was assembled, the current IT infrastructure was verified by updating existing IT documents, and

a project charter was composed to document the agreed project's scope, objectives and participants.

In order to coordinate and manage the project effectively, a project management plan was developed to manage the project works, schedules, and corresponding milestones, as well as staffing and communication. Moreover, a backup and recovery plan was prepared to assist the development team in ensuring the availability of the IT landscape. Thanks to the plan, the systems can be recovered quickly after a major disaster or human mistakes during configuration.

During the implementation phase, there are various tasks need to be done in sequential order to guarantee the system consistency. The most important tasks are listed in the WBS. The first things that need to be done are the verification of IT landscape, the installation and upgrade of SAP Solution Manager system, and the documentation and configuration of landscape information. Once all the aforementioned tasks are done, the actual configuration of ITSM scenarios is performed, including, for example, master data creation, authorization development, SLA configuration and so on. The details of those configuration tasks will be explained in the System Construction and Implementation section. After those configuration efforts, every setting and configuration step was documented in Word documents to troubleshoot any possible errors that we may have later.

After the system is installed, updated, and configured, various types of tests are performed to ensure that the system will operate as expected. To be more specific, the following tests have been being performed during the project:

- Backup and recovery tests
- Functional tests, including the tests for email notification function, Workflow and Dispatching Rules
- Performance and user acceptance tests.

Finally, the user training is conducted at the end of the project in the form of end-user training workshops. User manual, system documentation, and recovery instruction are produced to help the system users learn how to use, maintain and recover the system.

3.2 Project Management Plan

As part of the project plan, the following Gantt chart (Figure 2) was produced to keep track of the project tasks.

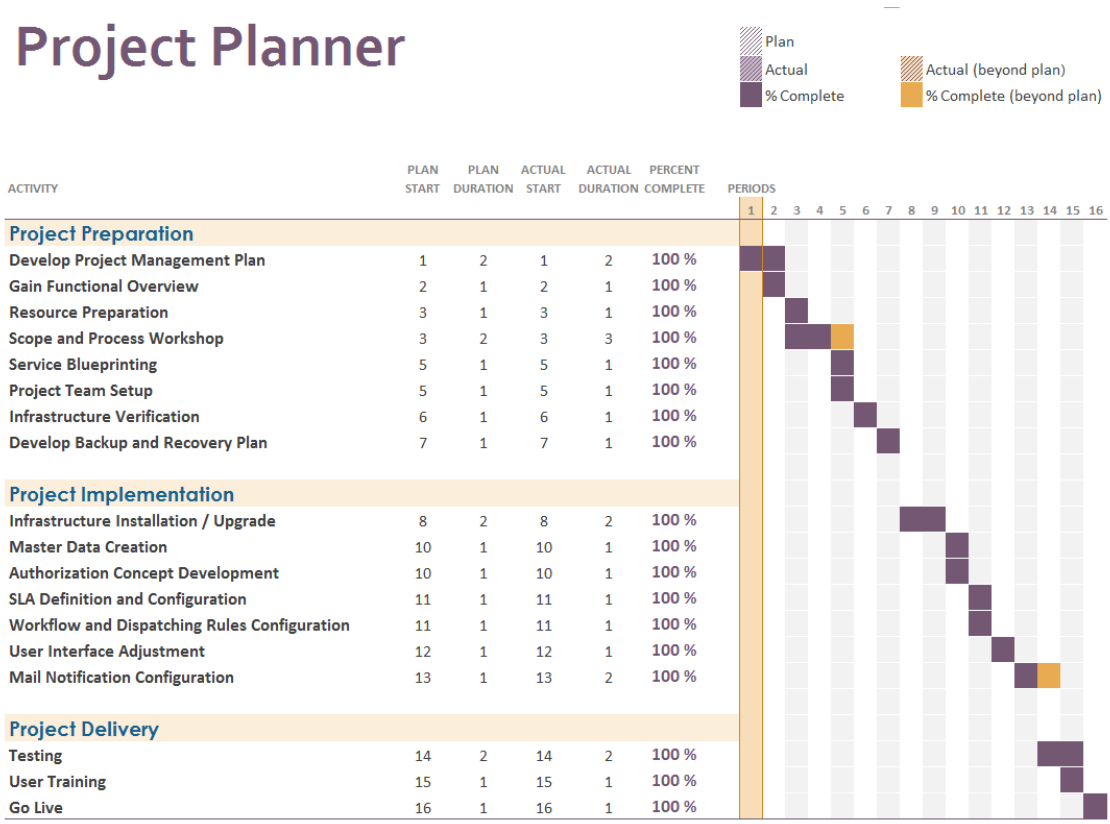


Figure 2: Project Gantt Chart

As being seen from the chart, the Project Initiation and Project Planning were grouped into the Project Implementation phase, to match the actual project timeline.

The management plan for project communication was documented in the following project communication matrix (Table 1):

Communicatio Type	Description	Frequency	Format	Participants/ Distribution	Deliverable
Weekly Project Team Meeting	Meeting to review tasks done and the project status	Weekly	In Person	Project Team	Meeting Minutes Reports
Project Gate Review	Present closeout of project phases		In	Project Team and	Project phase

	and kick off the next phase	As needed	Person	Stakeholders	completion report and phase kickoff
Outsourced Request	Request for services from the Hosting Partner	As needed	Email	Project Team, Hosting Partner	Confirmation on service fulfillment

Table 1: Project Communication Matrix

4 Knowledge Base

4.1 IT Service Management Overview

4.1.1 IT Service Management Basics

According to the ITIL Glossary and Abbreviations (2011), IT Service Management is defined as "The implementation and management of quality IT services that meet the needs of the business. IT service management is performed by IT service providers through an appropriate mix of people, process and information technology". It is thus concerned with the implementation of quality IT services that meet the needs of customers, and is performed by the IT service provider through an appropriate mix of people, process and information technology". In a nutshell, ITSM provides the organization's back-office a framework to structure IT Service activities and the related interactions of IT support members with the end-user for the main goal to sustain end customer.

Following the ITSM principles, the organization can evolve from centralized, stand-alone, technology-based practices into distributed, integrated, and process-driven disciplines. Table 2 summarizes some basic differences, mentioned by Williams (2013), between traditional IT System Management and IT Service Management:

Traditional IT Management	IT Service Management
Focusing on IT systems (IT Perspectives)	Focusing on customer and business perspectives

Supporting specific operations with more focus on In-House solutions	Enterprise-wide support integrating distributing and outsourcing solutions
Deploying one-off solutions with the use of informal processes	Deploying repeatable solutions and enforcing best practices
Reacting to incidents	Proactively preventing problems, and stresses on continual improvement

Table 2: Traditional IT Management versus IT Service Management

4.1.2 ITIL and Application Lifecycle Management

In his book about IT Service Management, Williams (2013, 31-32) described ITIL (formerly an acronym for Information Technology Infrastructure Library) as follow:

> ITIL provides the standard framework and practices to successfully adopt ITSM disciplines. The objective of ITIL is to align ITIL services to meet business requirements. […] ITIL provides procedures, tasks, and guidelines that can be applied independent of how organization's IT infrastructure is set up.

ITIL can be applied by an organization to plan, implement and measure IT services performance, as well as to demonstrate compliance and determine improvement. The framework and practices offered from ITIL are flexible and scalable that are independent of specific industry or type of organization, nor specific application or system.

Williams (2013) describes Application Lifecycle Management (ALM) as a set of "best practices, tools, processes and services to better manage the delivery of solutions to customers. ALM is not strictly SAP-centric; it provides the components […] to manage both SAP and non-SAP solutions". Rather than improving individual capabilities, ALM focuses on improving end-to-end ITSM processes by defining six phases of maintaining applications in accordance with ITIL. Williams (2013) illustrates these six phases with a diagram, which is reproduced in Figure 3:

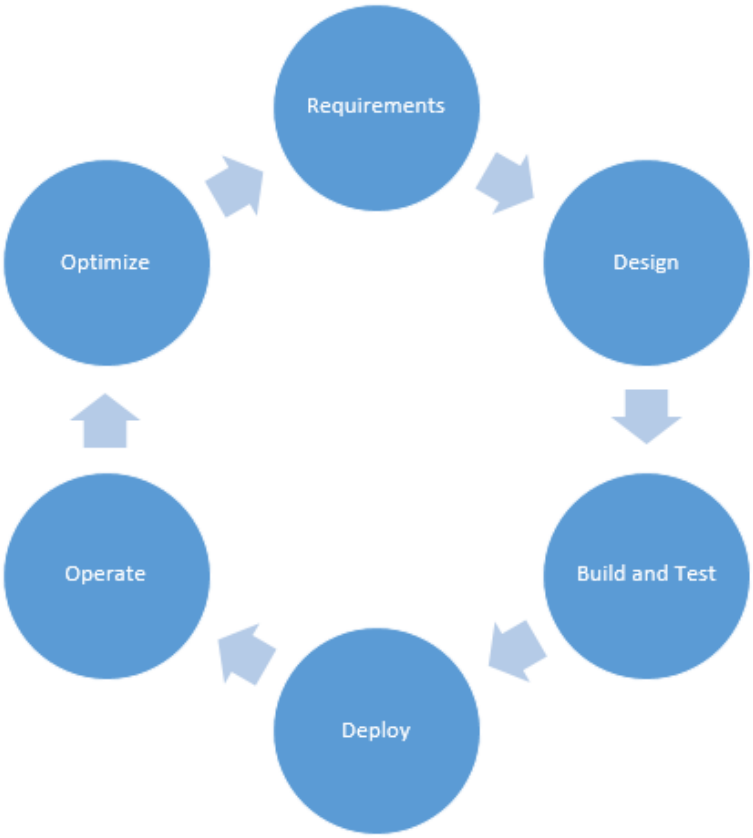


Figure 3: ALM Six-phases

Accordingly, throughout the Requirements phase, all business requirements are gathered by the project team which will be translated into functional design specification during the Design phase. The produced specification is then enabled by configuration or custom deployment, and tested in the third phase, before being incorporated into the customer's environment in the Deploy phase. After the Deploy phase, the solution goes live and the end users begin using the new functionality. During the operations, the services delivered will be monitored against a set of key performance indicators (KPIs) to guarantee that performance is at the agreed Service Level Agreement. The outcomes of the measured results are reviewed and analyzed in the Optimize phase to determine how to improve the current services.

4.1.3 SAP Solution Manager

SAP Solution Manager is an IT Management tool offered by SAP that supports all 15 ITIL service processes and is certified in ITIL v2011 edition (SAP Application Incident Management White Paper 2011). Accordingly, SAP Solution Manager enables ITSM processes and aligns to the ITIL framework by delivering the core ITIL best-practice processes out of the box.

Being an ITSM suites, SAP Solution Manager provides the platform for integration of tools, systems, and processes. In terms of systems integration and tools integration, SAP Solution Manager has the capability to technically connect many managed systems, both SAP and non-SAP systems, and provides integration capabilities with third-party tools. For example, an incident which can be created from a managed system or from a third-party help desk system can then be sent to the IT Service Desk component of SAP Solution Manager. Finally, SAP Solution Manager delivers an integrated platform to link between incidents, service requests, problems, and changes with each other, and thus, enables a smooth transition between different ITSM processes (e.g. from Incident Management to Problem Management or to Knowledge Management).

4.2 IT Service Management Processes

The core IT services and support processes enabled by SAP Solution Manager can be summarized in the Figure 4:

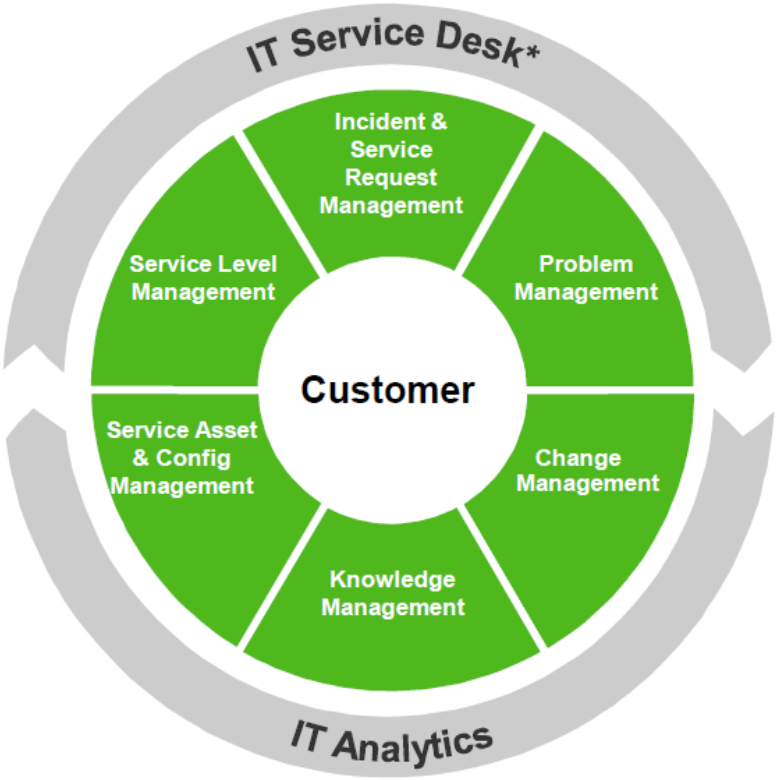


Figure 4: ITSM Processes in SAP Solution Manager
(SAP Application Incident Management White Paper 2011)

4.2.1 IT Service Desk

IT Service Desk provides a central point of contact between service providers and end-users (both Users and IT employees). In SAP Solution Manager, the IT Service Desk component provides the interface to users for various ITSM activities, which are Incident and Service Request Management, Problem Management, Change Management, Service Request Management, Knowledge Management, Service Asset Management, Configuration Management, and Service-Level Management. In this project, the IT Service Desk will be concerned mostly as the interface for end-users to report incidents and make service requests, as well as for BPS support staff to process those messages. In addition to the management and monitoring of incidents, service request and related interaction with end-users, the IT Service Desk provides the communication channel for change requests and knowledge articles, which are the follow-up documents of incident-related messages.

4.2.2 Application Incident Management

An incident is defined by Williams (2013) as an unplanned interruption to an IT service or a reduction in the quality of service delivered to a business. In addition, Williams (2013) states that:

> Restoring normal operations quickly, while minimizing the impact to the business, in a cost-effective manner can be considered the overall objective of Incident Management.
>
> Simply put, an incident is the result of a failure or error within an organization's IT landscape. Incidents can occur in SAP or non-SAP components; however, the process to resolve them – Incident Management – is typically standard regardless of the infrastructure in which the incident occurs.

Williams (2013) also explained that "the process to reach incident resolution must be executed in a formal and phased approach. Because the incident has already occurred and been affecting the business, a predefined process to reach conclusion and restore services must be in place to react to incidents of any type". According to ITIL, for fully closing an incident, there are six primary activities that must be fulfilled during the lifecycle of an incident. Those phases are depicted with a diagram by Williams (2013), and reproduced in Figure 5:

Figure 5: Incident Management Main Activities (Williams 2013, 40)

Accordingly, when encountering an application incident, users can manually record the incident from several inbound channels. Some examples of inbound channels are web portals, direct access to the Incident Management tool, phone call, email etc... In addition, an automatically workflow can be set up to record incidents based on specific triggers. An example of such triggers is the threshold met in system monitoring tool, which can trigger an email notification to a Service Desk.

After an incident is recorded, it will be classified by an initial support employee (e.g. according to priority, category, and risk values). If the initial support employee cannot solve the incident quickly, the incident can be escalated to a specialized support team to assist with the incident investigation and diagnosis by utilizing available resources, including knowledge databases to reach a solution.

Depending on the resolution details of the incident, it can be fully closed when the user who logged the incident confirm that he or she is satisfied with the provided solution. Closed incidents are kept in the system for future reference. Otherwise, some follow-on activities will commence, such as Change Management if the incident resolution requires a change to the IT landscape, or Problem Management if the root cause of the related incidents is identified but cannot be fixed yet.

The End-to-End Application Incident Management process is illustrated in more details in **Appendix 3**. Throughout the lifecycle of an incident, the Ownership, Monitoring, Tracking and Communication activities occur in an effort to coordinate each step of Incident Management. To be more specific, each incident must have an owner, be monitored to ensure SLAs are

being met, be tracked to ensure the business provided a timely solution, and be communicated to ensure transparency of the incident.

SAP Solution Manager provides the central tool to drive the activities within Incident Management and the ability to integrate into other processes such as Service Request Management and Problem Management.

4.2.3 Problem Management

Problems are defined by Williams (2016) as “unknown causes of one or several incidents […] Problems can be triggered by a single incident or several incidents that exhibit the common symptoms”. Problem Management aims to proactively prevent incidents from occurring and minimizing the impact of those incidents that are unavoidable.

Unlike the Incident Management process, the focus of resolving a problem is not on how quickly a resolution can be achieved. Because Problem Management is associated with determining and resolving the cause of an incident, the goal is to identify those causes to prevent future incidents.

According to ITIL, the activities illustrated in the Figure 6 relate to the lifecycle of a problem:

Figure 6: Problem Management Main Activities

Problems can be detected from one or more incidents logged within a Service Desk tool, or automated detection of the problem from the monitoring infrastructure. Upon being logged, the problem can be categorized and prioritized according to the impact, urgency, and severity of the problem. Often, a support team member will attempt to recreate the problem and try to develop a deeper understanding of what went wrong.

Workarounds can be applied to incidents as a temporary fix to the problem. Although a workaround provides a short-term solution to the incident and problem, it is important that the support team continue to conduct investigation and diagnosis to find a permanent resolution. If a workaround is available, the problem record should remain open until a permanent resolution is discovered.

A resolution should be applied to the problem as soon as it is found unless certain activities are required according to the organization's policies. When the permanent resolution is found, a known error record should be created to have documentation readily available when similar incidents or problem arise. When the necessary activities and follow-on processes have been completed, the problem can be formally closed. Related incidents that are linked to the problem should be closed as well.

Major problem review should be conducted on a periodic basis for all major problems that have been closed. The major problem review is basically a lesson-learned activity to identify what was done correctly, areas for improvement, and how to prevent the future problems and incidents.

4.2.4 Service Request Management

A service request is generally signified as a request from a user to ask for required information or provide new, or a change to existing IT services (e.g., new user setup or password change). Williams (2013) mentioned that "In ITIL, Service Request Management is most commonly referred to as Request Fulfilment. […] Request Fulfillment is associated with service requests that are considered low cost, low risk, and frequently occurring."

Different from the Incident Management process, service requests handling does not require an immediate response. Instead, the primary objective of Service Request Management is to provide the user with changes to services that are performed in a strict, well-defined, procedural, and controlled manner so that risk is not introduced to degrade business value.

In SAP Solution Manager, end-users create service requests document to specify a required service or information with the help of guide procedures to walk them through the steps to generate the service request. The service request is then processed by message processors with the help of checklists to walk them through the standard, repeatable procedures required to fulfill the service request. Such checklists are split into one or more tasks, which are assigned to various business partners. Once a task is marked within the checklist as complete, the system determines the next message processor, who will be able to view their workflow task within the ITSM Home Page and continue processing the checklist items.

4.2.5 Change Management

Williams (2013) demonstrated that "A change need to be approved by the Change Manager and/or Change Advisory Board. It's implemented, tested, and promoted to a production environment in a controlled way with minimal risk to existing IT infrastructure. […] The objective of Change Management is to enable efficient changes with a minimum disruption to the business and IT services. […] Moreover, the objective should be to create minimal incidents after the requested changes were deployed".

Williams (2013) also mentioned that “in the ITIL framework, Change Management is a part of Service Transition. […] ITIL assumes that this process will have standard processes and methods so that the new changes are handled efficiently”. Ideally, a single tool should be deployed to manage changes to prevent redundancy across tracking and reporting changes. SAP Solution Manager provides such integrated tool to manage changes in IT landscape.

The Change Request Management in SAP Solution Manager provide the messaging capabilities and the tool to document and manage activities performed throughout the lifecycle of a change. As a result, all changes’ details such as dates, times, users, and support documentation are documented in the system to provide audit log with full traceability. Furthermore, these details can be exported at any time depending on specific audit needs. In general, the goal of Change Request Management is to provide full control and transparency over change execution within IT landscape, and hence, to help organizations to plan for, implement, deploy, and support changes effectively.

4.2.6 Service Level Management

According to Williams (2013), Service Level Management provides capabilities to manage and monitor SLAs at the incident message level, then alert relevant stakeholders of service and response violations. Therefore, Service Level Agreement helps to enforce that incidents are handled according to contractually agreed-upon SLAs.

There are two key concepts within Service Level Agreement, namely as Initial Response Time (IRT) and Maximum Processing Time (MPT). The IRT “represents the calculated point in time in which an incident is first created […] and the first reaction by the message processor contracted in the SLA” (Williams 2013). The MPT refers “to the calculated point in between the creation of the incident and the time at which it is closed or confirmed. In other words, the MPT represents the total processing time allowed for an incident based on the contractual details outlined in the customer’s SLA” (Williams 2013).

SAP Solution Manager defines two types of profiles, namely as service profile and response profile. While the service profile specifies the availability time for incident processing, the response profile is where the time allotted between IRT and MPT. Some examples of service profile are 5x8 (5 days per week, 8 hours per day) or 7x24 (7 days per week, 24 hours per day).

4.2.7 Knowledge Management

In his book on IT Service Management, Williams (2013) explained that the focus of Knowledge Management is to document and publish the found solutions for the past incidents and problems of the organization for future reference in the form of knowledge articles. Furthermore, the knowledge articles should be stored on central location available for various stakeholders to access when needed. The benefit of this approach is to lessen the dependency and reliance on support staff to discover and provide a solution. SAP Solution Manager provides the central database to store and distribute the created knowledge articles to various users.

5 System Analysis

System Analysis, occurring during the early phases of system development, defines what an information system needs to do while system design defines how it needs to do it. The main objective of System Analysis is to discover system requirements, propose possible solutions and perform feasibility analysis.

In this project, the model-driven analysis approach was used, in which various pictures, charts and diagrams were developed to communicate business problems, system requirements, and possible solutions.

In order to discover requirements, multiple fact-finding techniques were used, including, for example, a sampling of existing documents, researching relevant literature, observing the current system and work environment, and interviewing the project stakeholders…

5.1 Problems Analysis

In the early phase of system analysis, we analyzed the perceived problems for causes and effects. The result of our analysis is summarized in Table 3.

CAUSE-AND-EFFECT ANALYSIS		SYSTEM IMPROVEMENT OBJECTIVES	
Problem / Opportunities	**Causes and Effects**	**System Objective**	**System Constraint**
The current	• It's time-consuming	• Decreases the time	• There will be no

support process includes many manual steps	to handle incidents and service requests • It's hard to find available documentation due to lack of central tools to store a found solutions and other documents • It's hard to keep track of processing efforts due to the lack of efficient reporting tools • Manual steps are prone to human errors	to process incidents and service requests • Provides a repository to store all the solutions and related documentation • Provides a reporting tool for managers to keep track of the incident and service requests processing progress • Avoid human-errors by automating some manual steps	increase in incident processing workforce • The new system must not require additional efforts and time to process reported incident, compared to the current process

Table 3: Problem, Opportunities, Objectives, and Constraints Matrix

In general, by investigating about the current support service of BPS Consulting Finland Oy, we concluded that the service includes many manual steps (which are prone to human errors), and lacks a central tool to document and keep track of incident processing efforts. Based on the project findings, the project team agreed that the service can be improved by modifying and automating some manual steps, as well as utilizing a tool to manage incidents and other service desk messages centrally.

5.2 Requirement Analysis

After discussion with BPS steering group, which including BPS's service leads, service coordinators, and specific-application consultants, we decided to integrate the ITSM Application, a component of SAP Solution Manager, to BPS Consulting Finland Ltd.'s support service. To be more specific, our team will configure a test system and prepare a demo for all BPS employees who involve in the BPS supporting processes to evaluate the products. If the new system is accepted by BPS steering group, we can then implement a production system, where all future service desk messages will be recorded and managed by the system.

The requirement analysis phase defines the business requirements for the new system, in other words, what the system need to do and what quality the system must have. The foundation for identifying requirements was established in the problem analysis phase when we identified system improvement objectives. Some important system requirements were identified and categorized into functional and nonfunctional requirements. They were

summarized in Table 4. In addition, the requirements are prioritized as the order they appear in the table (the first ones are the most important requirements, and therefore, need to be fulfilled and verified first)

Functional Requirements	Non-Functional Requirements
1. **The system provides automatic tool to manage reported incident and service requests** 2. **The system provides a repository to store found solutions and related documentation** 3. **The system provides a reporting tool to monitor incidents / service requests processing**	1. The system offers acceptable performance in terms of throughput and response time 2. The system is easy to learn and use. Documentation and training materials need to be developed and distributed to end-users.

Table 4: System Functional and Non-functional Requirements

5.3 Stakeholder Profiles

In order to understand and improve the end-to-end supporting process, we also need to understand the organizational structure of BPS Consulting Finland Ltd. service team. The organization chart (Figure 14) is shown below:

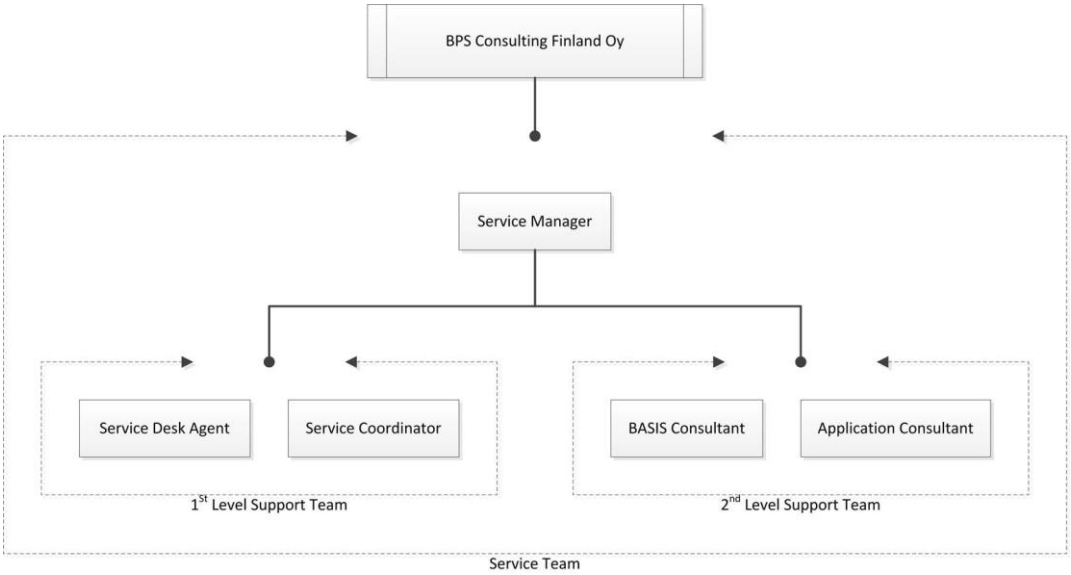


Figure 7: BPS Consulting Finland Service Organizational Chart

Based on the organizational structure, our team developed a tier support structure for BPS Service Desk team. Accordingly, messages (incidents, problems, or service requests) followed escalation, analysis and resolution paths. The tiered support structure is illustrated on Figure 15:

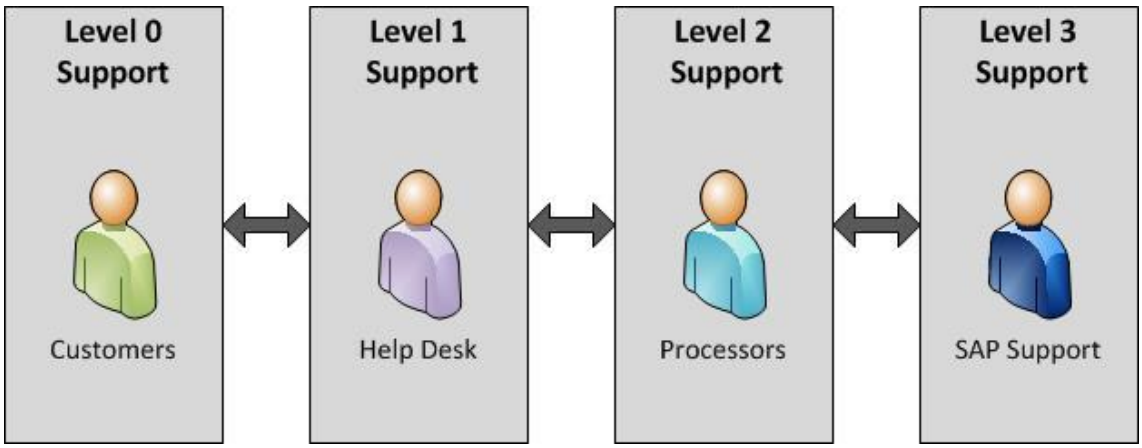


Figure 8: Multi-level Support Model

As can be seen from the picture, support messages originating from BPS's customers' end users are received by a Level 1 service team member, typically the BPS service desk agents. If the issues declared within those messages can't be resolved by Level 1 service personnel, the message is escalated to Level 2 team, which including application-specific experts (such as Technical support, network support, subject matter experts, BPS partners) ... If the Level 2 service team cannot provide resolution, they can forward the message to SAP Support (Level 3 support).

By interviewing and observing different actors in the current support processes of BPS, our team gathered the characteristics, the needs, experiences and expectation of each stakeholder. Subsequently, based on the acquired insights, we summarized the roles and responsibilities of each process actors in different personas. Those personas helped us to gather and summarize the characteristics of a specific stakeholder group.

At Level 0, the customers are the one who raises the incidents, problems or service request. Based on the features of each user (including their job functions, responsibility, access rights…), we categorized the users at the customer bases into two types: End Users and Key Users. Specifically, key users are responsible for executing some functions of SAP system, and hence, require direct access to SAP systems. On the contrary, end users may not see the SAP applications' user interfaces at all, but rather per-form their job using different interfaces or tools (which integrate with SAP system behind the scene).

Level 1 support personnel, which includes the Service Desk agents and Service Coordinators of BPS Consulting Finland, is responsible for receiving, processing the messages from customers. If Level 1 support cannot solve the issues quickly, they can dispatch the support messages to Level 2. After having received the messages from Level 1, resources within Level 2 support will deal with troubleshooting and analyzing the issues, which typically require a deeper technical understanding to reach a resolution. Throughout the lifecycle of a message, Level 2 support will continuously collaborate with level 1 support, for example, to clarify the issues. Level 2 support includes BPS Consulting Finland application-specific consultants and BPS's Partners employees.

Because, in most cases, SAP System landscapes are complex, composing different software components, the collaboration and coordination between different consultants are necessary in order to reach a solution. Each support employee of BPS Consulting Finland typically has different technical background and concentrates on different software components of SAP systems. Additionally, in some cases, BPS needs to work with its partners to provide a resolution. For example, if there is a network disruption, BPS needs to work with its hosting partner to solve the issue.

Table 5 summarizes the roles and actors in BPS Consulting Fin-land Ltd. tiered support model:

Support Tier	Role	Actors
Level 0	Message Reporter	Customers: • End users • Key users
Level 1	Message Dispatcher	Customers: • Key users BPS Consulting Finland Ltd.: • Service Desk Agents • Service Team Leads
Level 2	Message Processor	BPS Consulting Finland Ltd.: • Application-specific Consultant • IT Experts • System Administrators
Level 3	Message Processor	SAP Support

Table 5: Stakeholder Roles and Actors in Tiered Support Model

For each stakeholder profile, a persona can be developed to perform and in-depth research of service stakeholders. However, even though personas can provide a more detailed and individual understanding of a stakeholder group, personas are time-consuming to develop and might not be necessary for our project. Therefore, we only developed stakeholder profile instead. In fact, we did create a template for Personas, in the case that the project needs developing further in the future. An example of such Personas is shown on Figure 16:

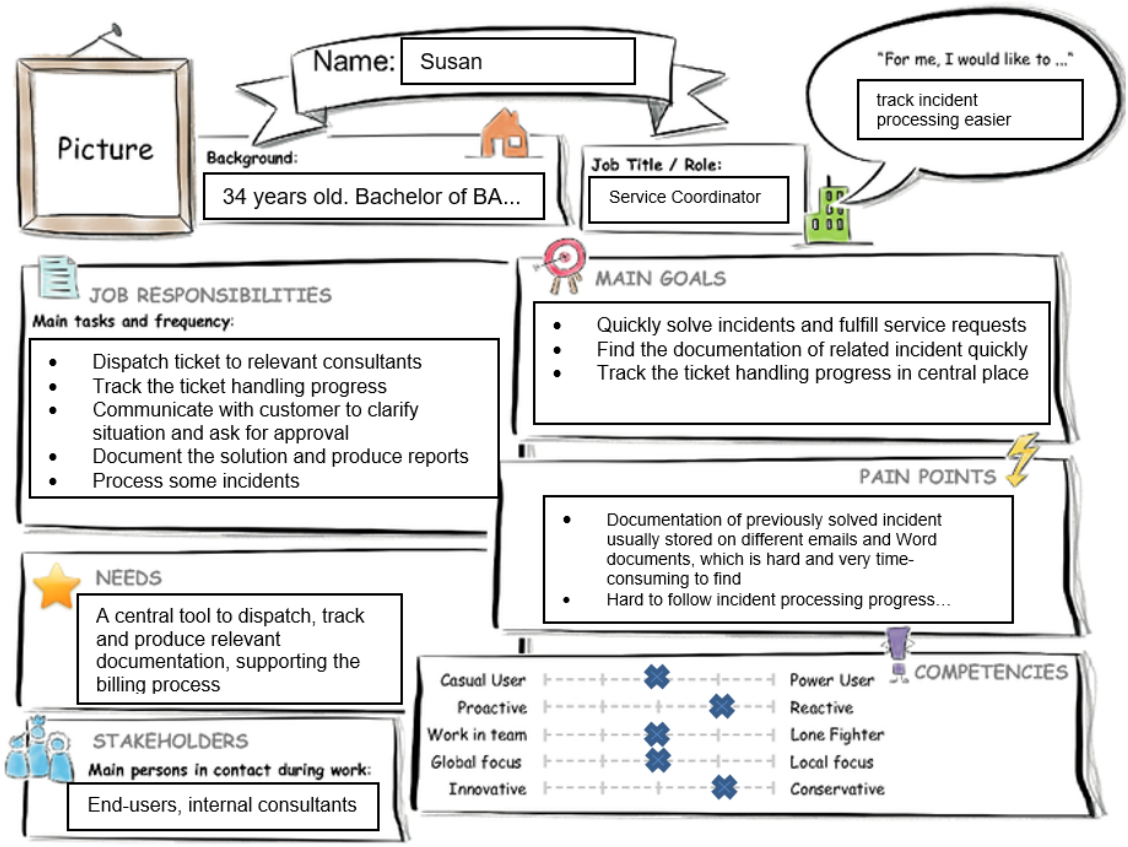


Figure 9: Personas Example - Service Coordinator

5.4 Use Cases Modeling

A simple context diagram was developed to illustrate how the IT Service Management system would interact with the surrounding environment regarding the system inputs and outputs:

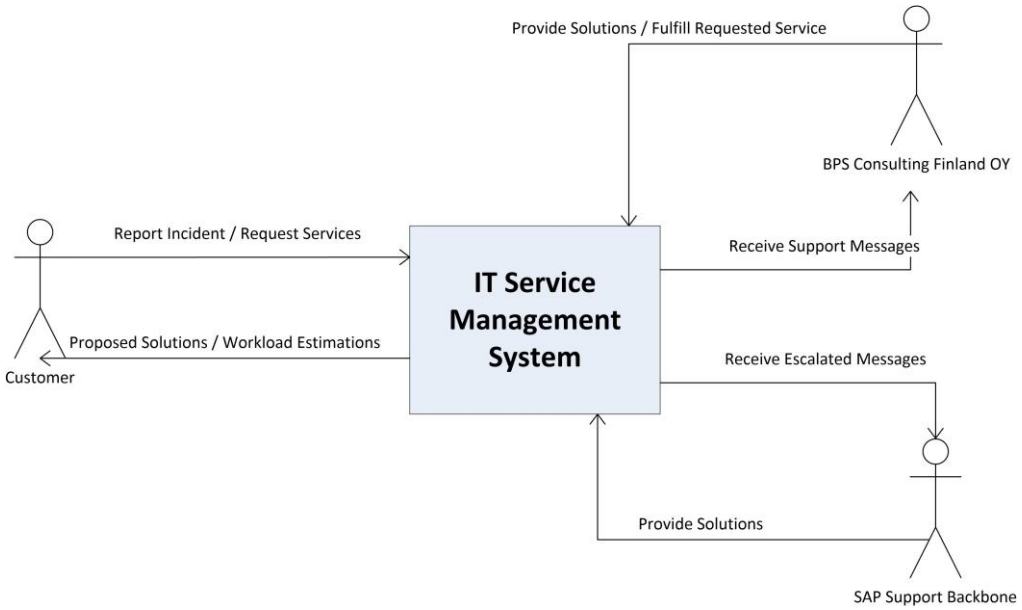


Figure 10: ITSM System Context Diagram

As can be seen from the diagram, the customer will send service support messages (to report incidents and request services) to the ITSM system. From the system, BPS Consulting Finland Ltd. consultants will receive the messages, then provide a solution or inform the customer about the service fulfillment progress with the help of the system. In case the reported incidents cannot be solved by BPS Consulting Finland Ltd.'s consultants, the incidents can be escalated from the ITSM system to SAP Support Backbone, who will work and provide solutions to customers.

Based on the context diagram, the business actors were identified and summarized in Table 6:

Business Actors	Synonym	Description
Key Users	Reporter (Customer Users or BPS Service Desk Agent)	SAP system users who report incidents or request new services
BPS Service Coordinators	Dispatcher, Level 1 Support	The service coordinators at BPS Consulting Finland Ltd. who receive support service messages from reporters and dispatch the messages to SAP Application-specific consultant
BPS Application Consultants	Processor, Level 2 Support	The Application-specific consultants at BPS Consulting Finland Ltd. who process the support messages, work to provide solution (for

		incidents) or effort estimation (in cases of service requests)
SAP Support	Processor, Level 3 Support	The support service from SAP

Table 6: Actors Glossary

The IT Service Management system has many use cases. However, due to the time and cost restriction, we only identify the most important use cases based on the context diagram. The identified use cases are documented in the following use-case glossary (Table 7):

No.	Use-Case Name	Use-Case Description	Participating Actors and Roles
1	Report Incident	This use case describes the event of incident ticket creation	Key User / Reporter
2	Request Service	This use case describes the event of SAP System user requesting services from BPS Consulting Finland Ltd.	Key User / Reporter
3	Receive Ticket	This use case describes the event of BPS Service Coordinator receiving the service support message from Reporter	BPS Service Coordinator
4	Dispatch Ticket	This use case describes the event of BPS Service Coordinator dispatching the service support message BPS Application Consultant or escalating the message to SAP Support	BPS Service Coordinator
5	Process Ticket	This use case describes the event of BPS Application-specific Consultant or SAP Support process the support message and starts to work on the solution (or provide workload estimation)	BPS Application Consultant, SAP Support
6	Propose Solution	This use case describes the event of possible solution was found and delivers to the support service reporter.	BPS Application Consultant, SAP Support

7	Perform Acceptance Test	This use case describes the event of reporter, after having received the proposed solution or workload estimation, performs acceptance test	Key User / Reporter
8	Document Solution	This use case describes the event of message processors (BPS Consultants and SAP Support) document solution and other related information in the ITSM System.	BPS Application Consultant, SAP Support

Table 7: ITSM Use Cases Glossary

In the end, the functional requirements were modeled in the following use case diagram (Figure 8):

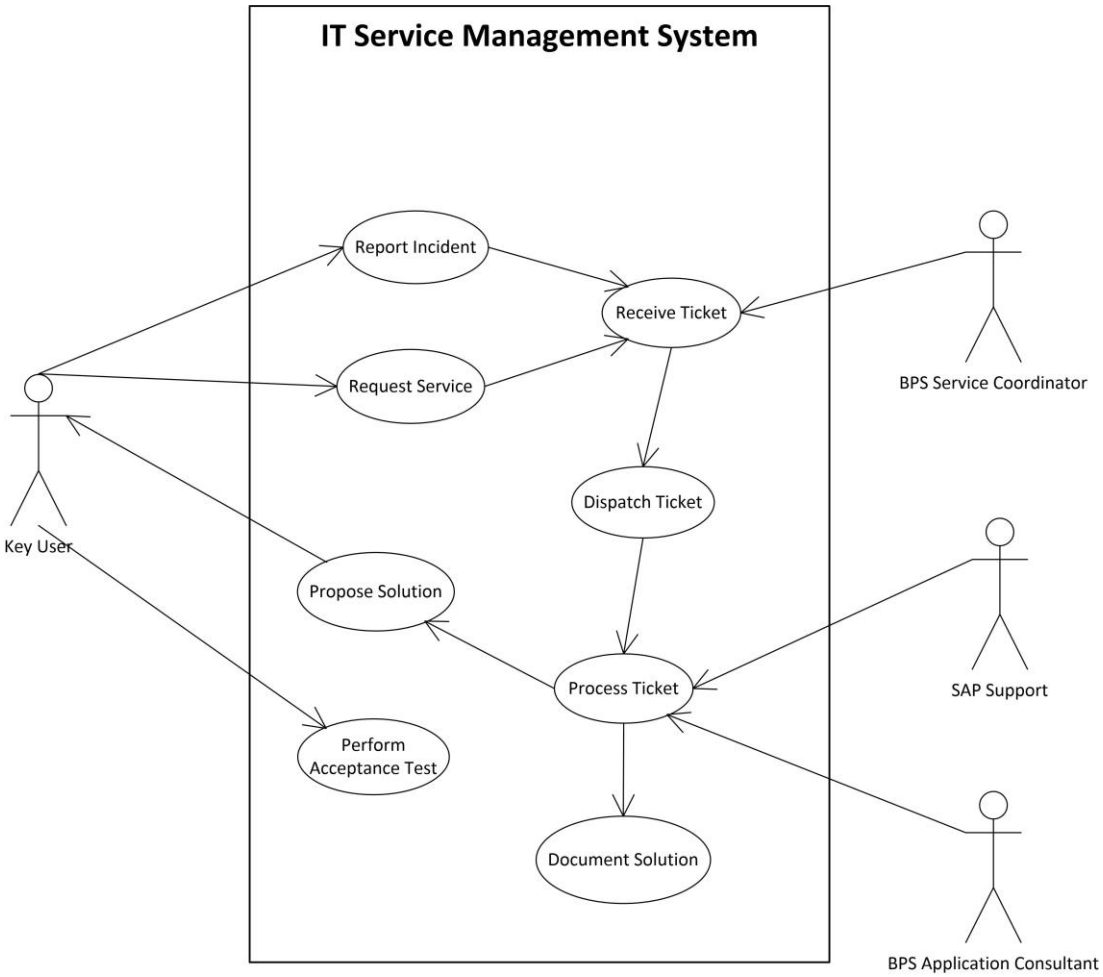


Figure 11: ITSM System Use Cases Diagram

5.5 Process Modeling

Because the future IT Service Management system is complex to fully understand when being viewed as a whole, it was decided to separate the system into smaller components. To be more specific, the ITSM System is partitioned into logical sub-systems of processes in order to improve communication, as well as to simply the analysis and design process. As a result, the functional decomposition and structure of the future IT Service Management system are illustrated in Figure 9:

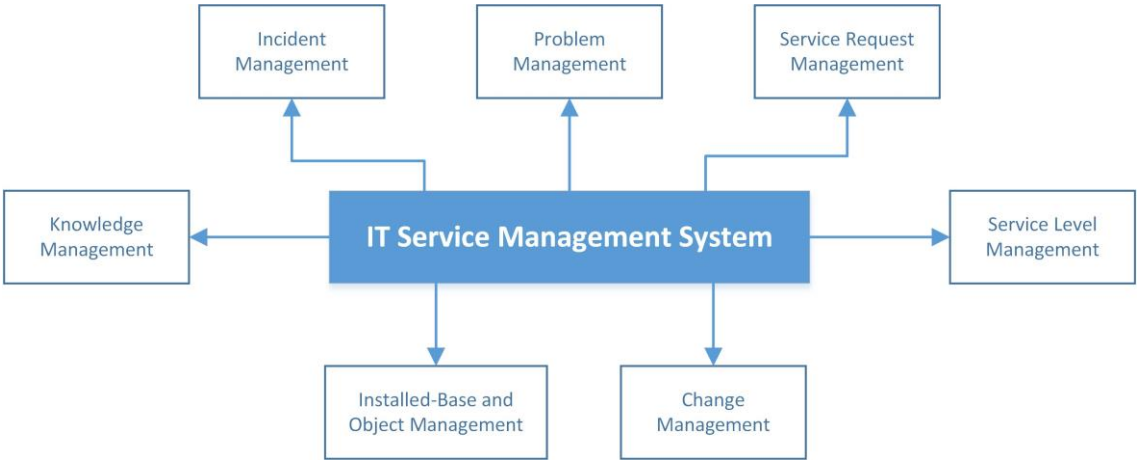


Figure 12: ITSM System Functional Decomposition Diagram

As can be seen from the above diagram, the IT Service Management System has been segregated into 7 sub-components, namely as Incident Management, Problem Management, Service Request Management, Service Level Management, Change Management, Installed-Base and Object Management, Knowledge Management. The three most important sub-components are Incident Management, Problem Management, and Service Request Management. These important subsystems are addressed first in this project, whereas the configuration and settings Change Management might be tackled later to improve the support service of BPS further in the future. The other three subcomponents, namely as Installed-base and Object Management, Knowledge Management, and Service Level Management are integral and delivered out-of-the-box from SAP. Therefore, as soon as the basic settings for Incident Management were done, the functionalities of the three aforementioned components will be available to system users.

The functional decomposition of the three most important subcomponents (Incident Management, Problem Management, and Service Request Management) are illustrated in Figure 10 on the next page.

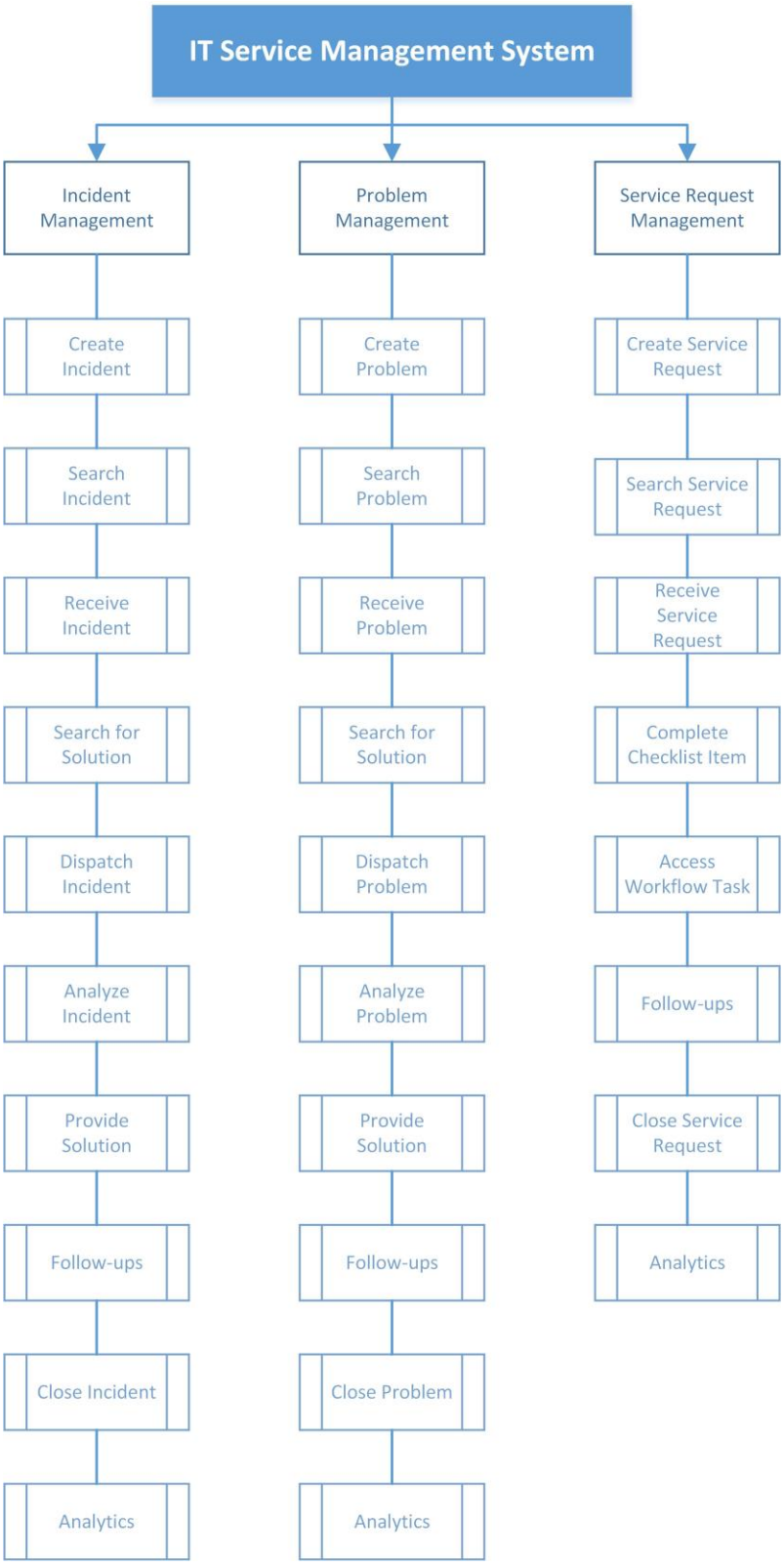


Figure 13: ITSM System Functional Decomposition Diagram with Tasks

It can be seen from the diagram that all three important subcomponents have the Analytics task, which will be used for reporting some essential Key Performance Indicators (aka. API).

Based on the defined KPIs, we can measure the efficiency of each sub-component, and consequently suggest the ways to improve and optimize the respect processes.

The Incident Management and Problem Management comprise of similar tasks, whereas the Service Request Management has two distinct tasks, namely as Complete Checklist Item and Access Workflow Task. These two tasks will be performed to actually accomplish the service request fulfillment process. Since the Service Request Management is a repeatable process, there is no need for search, dispatch or analysis steps in Incident Management or Problem Management.

5.5.1 Incident Management Process Modeling

The Incident Management process is modeled in Figure 11:

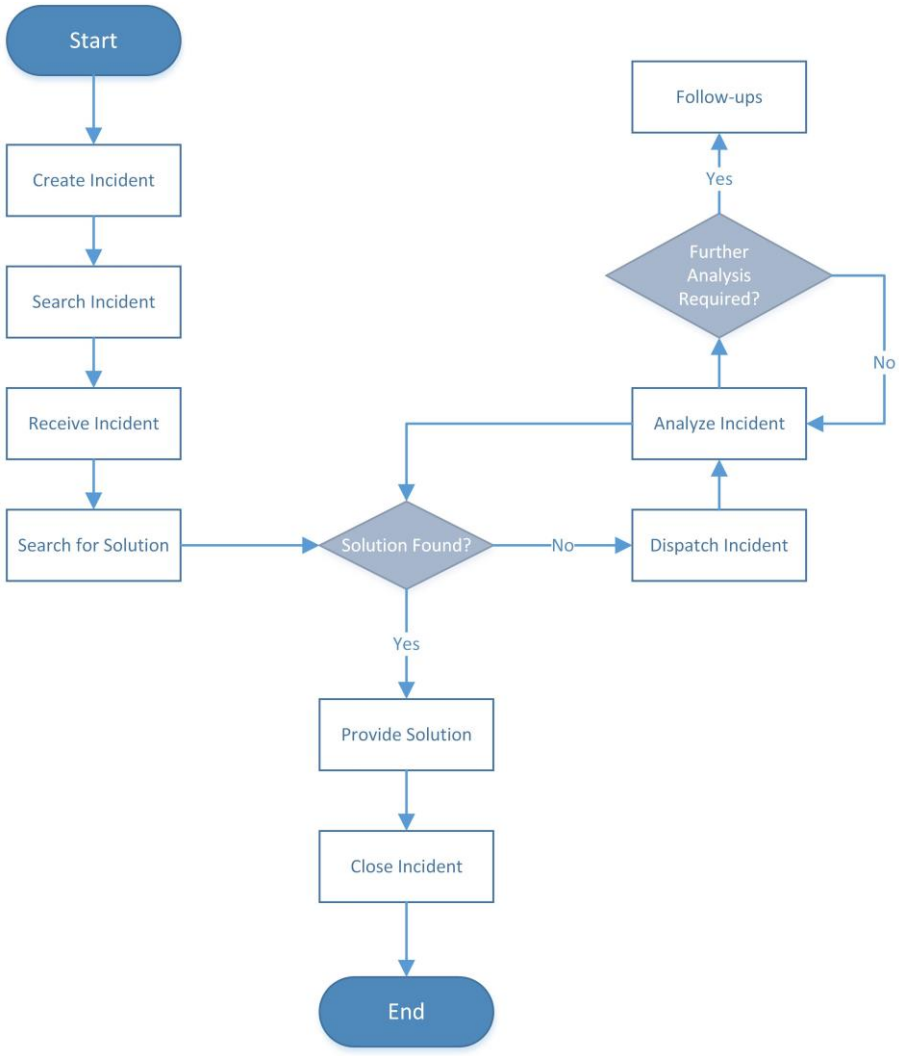


Figure 14: Incident Management Process Model

Throughout Incident Management, several integration points into Problem Management and Knowledge Management. The integration is represented by the Follow-ups task, where problem tickets or knowledge articles can be created as the follow-up of the incident ticket. In addition, while searching for a solution, the system will provide the functionality to search from a list of created knowledge articles.

5.5.2 Problem Management Process Modeling

The Problem Management process is modeled in Figure 12:

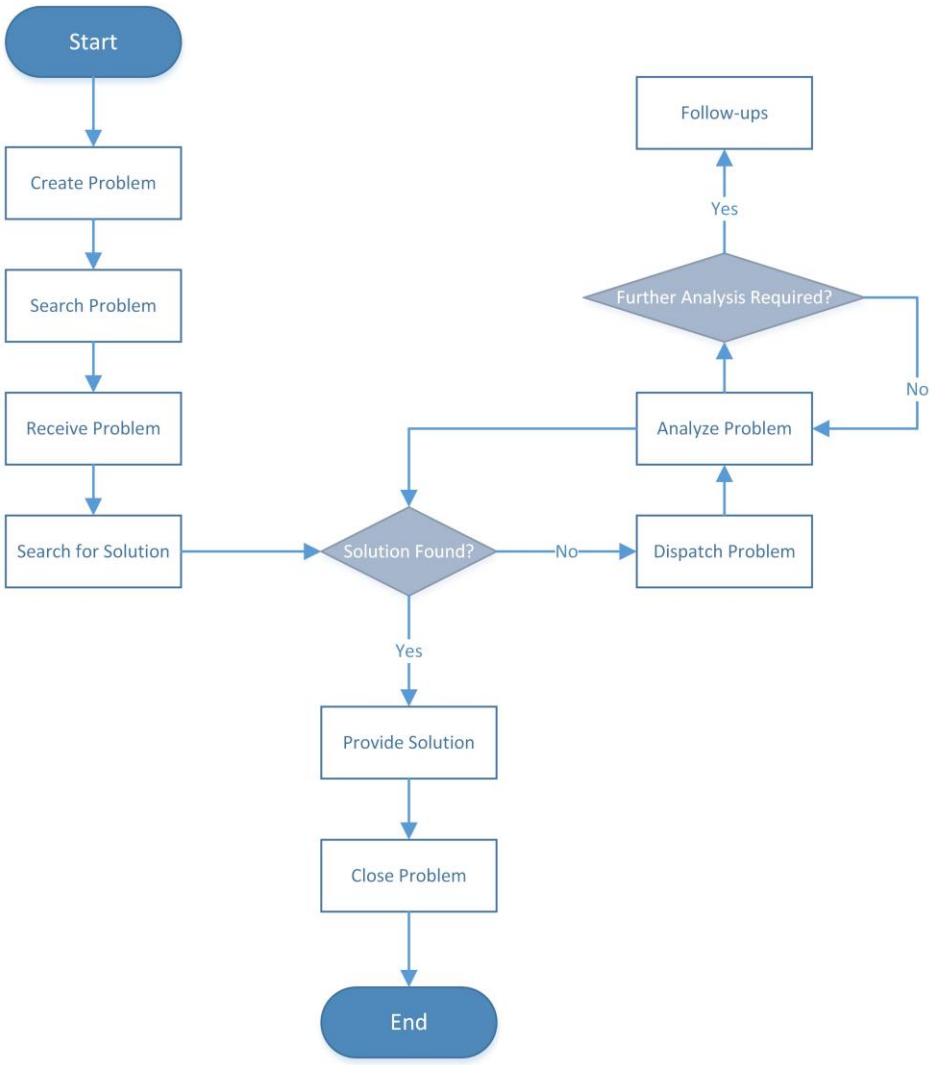


Figure 15: Problem Management Process Model

Besides creating the problem ticket as a follow-up of an incident ticket, the Problem Management can also be initiated independently from Incident Management. However, the recommended method to launch the Problem Management is from Incident Management to

provide further analysis as being illustrated previously in the Incident Management Process model. In this case, several related incidents can be locked to one problem ticket, thereby, closing the problem ticket will close all locked incident as well. This functionality is, therefore, aids in faster application incident resolution and more efficient management of multiple support messages. Moreover, locking of incident tickets can enable more efficient management and planning of activities by ensuring messages will be handled in a logical sequence or in parallel.

In case the problem resolution requires a change to the system landscape, a change request can be created as a follow-up to a problem ticket. In order to enable the integration between Problem Management and Change Management, Change Request Management will need to be configured in SAP Solution Manager. However, the Change Management is not in the scope of this project, so it might be enabled later depending on the company's requirements.

Similar to Incident Management, knowledge articles can also be created as a follow-up activity of problem ticket, as well as be accessed during the Search for Solution task in Problem Management.

5.5.3 Service Request Management Process Modeling

The Service Request Management process is modeled in Figure 13:

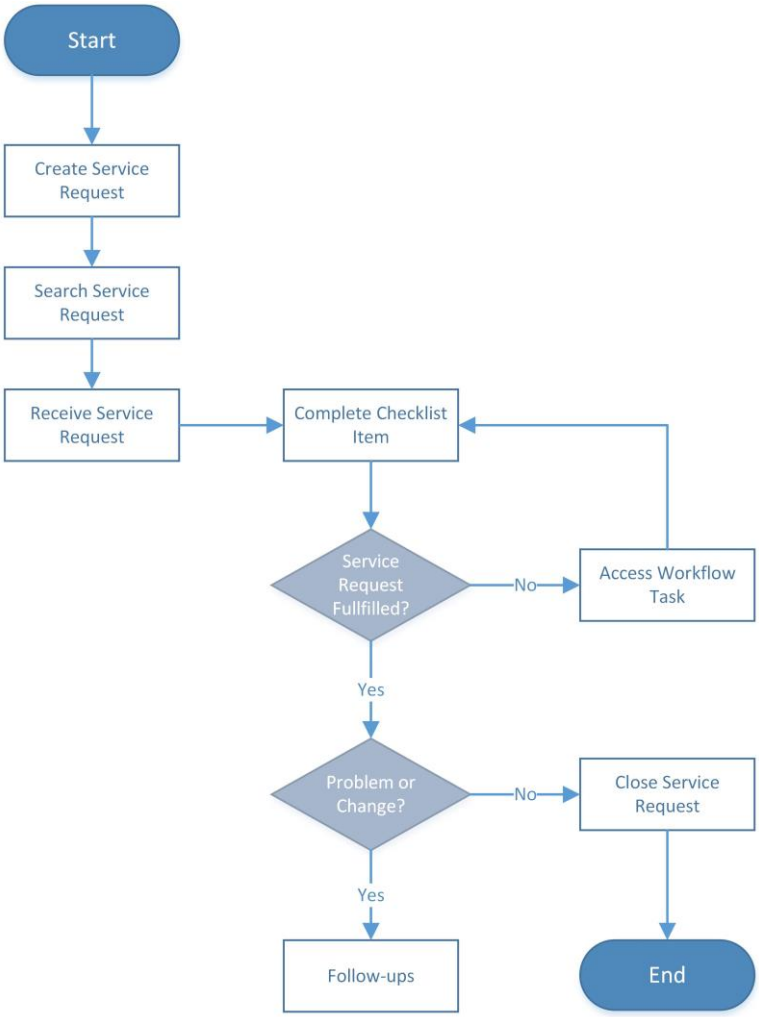


Figure 16: Service Request Management Process Model

The diagram depicts, in high level, how service requests are fulfilled in an organization.

Similar to Problem Management, the Service Request Management process can be integrated into other ITSM processes if needed. For example, problem messages or change requests can be created as follow-ups to service request ticket.

5.6 Customer Journeys and Business Blueprints

The support service of BPS is complex and involves different types of support messages: incident messages for application incidents handling, or problem messages for root cause analysis of incidents, or service messages for requesting additional services (including, for example, system change requests, or requests for IT services such as database backup, user password reset…). Therefore, in this section, many customer journey maps were developed,

each map described a user journey for the processing of a particular type of support messages.

Using the customer journey maps created as a starting point, we developed service blueprints to describe the support service of BPS Consulting Finland Ltd. in more details. The produced service blueprints described all the touch-points and core business processes constituting the support service, including the backstage processes. The information documented in those blueprints can guide us to verify, implement and maintain the support service in the future.

Due to the complexity of BPS Consulting Finland Ltd.'s support service, which involves many support message types, our team developed 3 separate service blueprints, each describes the processing of a particular message type, just like what we did with the customer journey maps.

5.6.1 Incident Management Process Customer Journey

The current customer journey for processing an incident message is illustrated in Appendix **3**. When end users detect an incident while performing their job, they will typically report the incident to the key user. The key user then recorded the incident details, classify the incidents (according to priority and impact on the business), and try to solve incidents. If the key user cannot solve the incident, he or she will then contact BPS coordinator by email, or phone (in the cases of emergent incidents).

Alternatively, some customers of BPS Consulting Finland Ltd. have BPS employees monitor their systems. In those cases, the BPS Service Desk agents will monitor those systems by following the monitoring guidelines agreed between BPS and customers. If the agents find an issue in monitored system, they will report it to service coordinators.

After having received the messages from key users or service desk agents, service coordinators will process the messages, create a service desk ticket, work on the solution and then propose the solution to customers' key users. To solve the issue, service coordinators may need to collaborate with IT experts, specific area SAP consultant, as well as a hosting partner.

As receiving the solution from BPS's service coordinators, customers will perform acceptance tests and determine whether they will implement the proposed solution or not. In case the proposed solution is not accepted, the customer might demand a rework for BPS to find another possible solution.

The downside of the current incident message-related customer journey lies in the touch-points between different stakeholders. Emails and phone calls, which are currently used as the communication channels, are hard and time-consuming to record and share the information with other service stakeholders. As a result, the incident processing time will be longer because the message processors might need more time to gather all relevant information in order to solve the reported incidents. For instance, due to the lack of central location to store and share incident processing information, incident processors might spend lots of time seeking the documented solution of a similar incident that occurred (and solved) before, in many mailboxes and shared network folders. The situation can get worse when the previous incident processors did not forward the emails with the incident processing information to shared mailboxes, or did not document and save incident processing reports in shared network folders. In this case, the current message processors might need to go through the incident investigating process all over again, from gathering the required information, inspecting the root cause of the incident, and finally, providing the solution to customers, which might be already available and documented somewhere. Another example reason for extended incident processing time is when the customer's key users did not provide enough relevant information for the BPS support staff to process the incident. This circumstance can result in the "ping-pong situation", in which the customers' end-user and BPS coordinators need to contacts each other several times to complete the incident description and provide other relevant data for incident processing. One way to mitigate this drawback is utilizing SAP ITSM Application to record and keep track of the interaction between the end-users and service coordinators. Additionally, the SAP ITSM Application can also gather technical context data, such as application version and the system component where the error occurs automatically in the background, so that the message processor can locate the point-of-failure faster.

For future customers, the customer's key users can be provided with the URL of BPS's Solution Manager from which they can use to access the system from the web interface. In this case, they may need to specify the address of the Solution Manager system in the hosts file manually if the server hosting BPS's Solution Manager is not known by the DNS server of the customers' domains.

The **Appendix 4** depicts the future customer journey when SAP ITSM Application is integrated to the incident management process. Accordingly, SAP ITSM Application can be used as communication channel for end-users to report incidents to BPS service coordinators, for service coordinators to exchange information with incident processors, for incident processors to collaborate with hosting partners, and for service coordinators to inform end-users about incident processing status and proposed a solution. With SAP ITSM Application, emails and

information obtained during phone calls can be recorded and stored centrally in ITSM application as an “incident ticket”. Thereafter, each subsequent interaction between stakeholders about that incident, including notes and decisions made, can be recorded in a single ticket, enabling the transparency, end-to-end incident management process.

5.6.2 Incident Management Process Business Blueprint

The service blueprints for processing an incident message is illustrated in Appendix **5**. Accordingly, the processing of an incident-related messages includes many business process steps, performed by many types of stakeholders, and related to many other services (or processes). The corresponding services are Technical/Business Process Monitoring, Change Request Management, and Problem Management. Those services can be integrated with Incident Management thanks to SAP Solution Manager, a platform for Application Lifecycle Management (ALM). Such integrated services can help BPS Consulting Finland Ltd. to provide consistent services and reduce management efforts. The SAP ITSM Application is a component of SAP Solution Manager.

The documents serving as the physical evidence for Incident Management are Service Level Agreement (SLA) documents, incident reports, and the proposed solution documentation. If SAP ITSM application is used in the future, those artifacts can be created directly from the application. Moreover, any updates on those documents are transparent to other users as required, keeping them well-informed about the processing progress, and therefore, increase their satisfaction level.

5.6.3 Problem Management Process Customer Journey

The current customer journey for processing a problem message is represented in Appendix **6.** Like the incident management, problem management process starts with a request from customers’ end-users, in this case, with the intention to determine the root cause of incidents. In the cases of many similar incidents occurred in a system, it is expected that there is an underlying cause; hence, solving this cause can, in turn, solving many associated incidents. The weakness of the current problem management process relates to the use of email as the only communication channel and the manual steps for recording and tracking of problems, as well as their associated incidents.

To overcome the aforementioned weaknesses, SAP ITSM Application can be used as a communication channel that records the interaction between various stakeholders in problem

management process. Furthermore, the application can automate the problem management process in the way that if a root cause is found and solved, all the corresponding incident tickets are automatically closed, speeding up the incident management process and reducing processing effort in the future. The **Appendix 7** shows the future customer journey when SAP ITSM Application is integrated to the problem management process of BPS.

5.6.4 Problem Management Process Business Blueprint

The service blueprint for processing a problem message is represented in Appendix **8**. Like Incident Management, Problem Management involves many stakeholders and business processes steps. It is initiated by Incident Management with the creation of Root Cause Analysis (RCA) requests. In a nutshell, when there are many similar incidents occurred in the system, customers' end-users or the service coordinators can ask the application consultants and/or IT experts to investigate the root cause of those incidents. After the root cause is identified, the service coordinators then send the proposed solution or workaround to the customer and ask for acceptance. If the proposed solution/workaround is accepted by the customer, the problem resolution process starts, typically with Change Management process when technical changes are required to troubleshoot the cause of incidents.

With the employment of SAP Solution Manager and ITSM application, Problem Management can be improved by having automatic steps and integration points to other services, which in turns, can reduce the processing time and increase satisfaction level. For example, after incident tickets are created during Incident Management, they can be grouped to create a problem message directly from SAP ITSM application. Subsequently, when the problem is solved, all incident tickets grouped under that problem message are closed automatically as well.

5.6.5 Service Request Management Process Customer Journey

The current customer journey for processing a service request message is represented in Appendix 9. Even though the service request messages are not as critical as incident and problem ones, the service request management can also be improved with SAP ITSM application by providing a central tool to record and keep track of service request processing, in the same way as for Incident Management and Problem Management. The Appendix 10 illustrates the future customer journey with SAP ITSM Application being integrated to the service request management process.

5.6.6 Service Request Management Process Business Blueprint

The business blueprint for processing a service request message is shown in Appendix 11. Service requests can be initiated by customers' end-users or BPS employees. When the customers' end-users have new business requirements that may require a change to applications or system landscape, the key-user from customer side typically requests of Cost Estimation (CE requests) to estimate the time and efforts needed to deliver the service. The created cost estimation request is then sent to BPS service coordinator to estimate the cost. Having received the cost estimation, the customer will make the decision whether the service need to be implemented or not. In the case the customers want the requested service to be delivered, the key-user will then inform BPS service coordinators to start the service delivering process, which may require application consultants, IT expert and hosting partners working together to fulfill the customer's requirement.

Besides cost estimation and service requests, other documents produced during Service Request Management include the Service Fulfilment Notification to inform the customer when the service is ready, and the Service Instruction to guide the customer how to utilize the new service. Typically, the physical evidence of Service Request Management is produced manually, and sent to the customer by emails. However, internally created messages, such as service requests and notes producing during service delivering process can be created and stored in SAP ITSM application. The benefits of storing the service requests and their associated information are improving communication among BPS Consulting Finland Ltd. support staff and the integration with other processes, such as Change Management and Problem Management.

5.7 Solution Proposal and Feasibility Analysis

In this project, there was only one proposed solution, which was utilizing the SAP ITSM Application in SAP Solution Manager. Consequently, it is not necessary to compare among different alternatives.

A feasibility checkpoint was realized to assess and review the feasibility of implementing SAP ITSM Application. According to the outcome of the checkpoint, the project may be canceled despite whatever resources have been spent.

During the checkpoint, 5 feasibilities tests were performed, namely as Operational Feasibility, Political Feasibility, Technical Feasibility, Schedule Feasibility, and Economic Feasibility. The description and result of those five tests were summarized in Table 8:

Feasibility Test	Description	Outcome
Operational Feasibility	A measure of how well a solution would meet the identified system requirements	The ITSM tools provided by SAP Solution Manager cover most of the functional requirements from the project stakeholders. There are some concerns at the beginning of the project about the integration with Microsoft Outlook as an inbound channel for creating ITSM tickets. As it is not clear if there is an add-in for Outlook to create ITSM tickets directly or not, this specific functional requirement needs to be reassessed later in the project, specifically after the test system has been configured.
Political Feasibility	A measure of how project stakeholders feels about the proposed solution and how well it will be accepted by the stakeholders.	The project is supported by BPS managers and they express their interest in implementing the ITSM Application. However, the end-users might be resistant to some future changes since the new solution may change their working convention. The project team believed this problem would be able to be overcome by incorporating as many current processes to the future system as possible, and provide proper training and a detailed user manual. An example of current processes which can be integrated into the ITSM Application is keeping the channels where end-users can report the incidents, and at the same time, enable service coordinator to manage the customers' messages centrally in the ITSM Application and provide automatic tickets tracking system.
Technical Feasibility	A measure of the practicality of the proposed solution is in terms of the availability of technical resources and expertise to implement and maintain it	The proposed solution is practical because the system was used by SAP themselves and proved to be mature and stable enough to offer to large customer base.
Schedule Feasibility	A measure of how reasonable the project timetable is	The proposed project schedule is acceptable
Economic Feasibility	A measure of the cost-effectiveness of the project	It is acceptable because the project can be done internally, and therefore, no external consulting costs would be required.

		Additionally, SAP Solution Manager is free for SAP customer, and BPS already has an available physical server, so no need to procure any additional hardware or software.

Table 8: Project Feasibility Tests

6 System Construction and Implementation

6.1 System Architecture

The architecture of IT landscape with SAP Solution Manager is the central IT Service Management tool is illustrated in the SAP Application Incident White Paper (2011), which is reproduced in Figure 17:

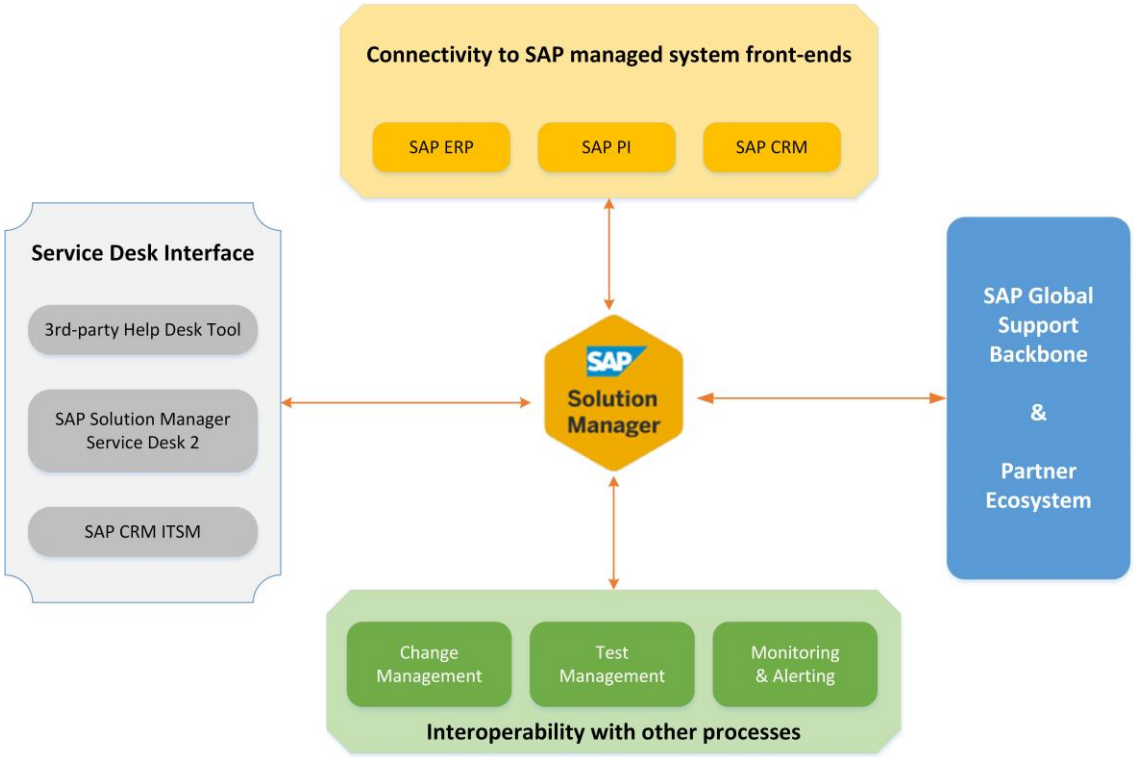


Figure 17: SAP Solution Manager System Landscape
(SAP Application Incident Management 2011)

As can be seen from the figure, SAP Solution Manager provides many integration points that are relevant to application incident management.

Firstly, by providing the connectivity to SAP managed systems, such as SAP ERP or SAP CRM systems, the end-user can create the incident ticket directly from the managed system, the ticket will then be sent automatically to the IT Service Desk of SAP Solution Manager. Typically, SAP managed systems such as SAP ERP, SAP Customer Relationship Management and SAP Process Integration will be connected to SAP Solution Manager via RFC connections.

Secondly, by providing the connection to SAP Global Support Backbone, the ticket processors can search for a solution from SAP knowledge articles (in the form of S-Notes) or forward to a ticket to SAP Global Support for third-level support.

Thirdly, tickets created from another SAP Solution Manager system or SAP CRM Service Desk can be forward directly to the SAP Solution Manager system, thanks to the shared underlying architecture. Furthermore, SAP Solution Manager also provides the Web service interface to integrate SAP Solution Manger with third-party service desk tool.

Last but not least, the ITSM component of Solution Manager can have direct integration with other Application Lifecycle Management processes, namely as Change Management, Test Management or Monitoring and Alerting. For example, an alert raised by the system automatic monitoring can be configured to create an incident automatically. Another example is creating a problem message as the follow-up document of an incident directly from the Service Desk tool of SAP Solution Manager.

6.2 System Installation and Configuration

There are two Solution Manager systems were installed at the same time: one as a test system and another as a production system. The two servers were installed on the same physical server, but on two different virtual machines.

The configuration was first done in a test system, and then after all the scenarios have been tested extensively by end-users, the configuration of production system was performed. The configuration of ITSM scenarios was assisted by SAP Solution Manager Guided Procedure that guides me through the basic configuration settings for the ITSM scenario. With the design and specification in place, the configuration of production Solution Manager systems takes only a working day to finish.

In general, the configuration of ITSM is comprised of 4 major phases, namely as System Preparation and Basic Configuration, Managed System Configuration, and IT Service Management configuration. During the System Preparation phase and Basic Configuration

phases, the required technical users were created, system installation checks were performed, SAP central correction notes (including the fixes to various configurations within SAP Solution Manager) were implemented in the systems, system landscape information was prepared, and the connection to SAP Support was set up. The Guided Procedure for System Preparation was shown on Figure 18:

Figure 18: System Preparation Configuration Guided Procedure

Then, in the Managed System Configuration phase, the connections between SAP Solution Manager and the managed systems were configured up and many checks were performed to ensure that the system connecting to SAP Solution Manager fulfilled the required technical requirements (which may result in some system components updates required on the managed systems). The Guided Procedure for ITSM Configuration is as follow:

Figure 19: ITSM Configuration Guided Procedure

6.2.1 Transaction Types Configuration

One of the most important configuration steps of ITSM is the creation of document types (in SAP terms, these are called transaction types). The transaction types defined the attributes and characteristics of IT messages, such as incident messages, problem messages, requests for change, service requests messages, and knowledge articles… The summary of the transaction types related to Application Incident Management were illustrated in the next figure:

Trans.Type	Short Description	Description
SMIN	Incident	Incident (IT Service Management)
SMIS	Incident ISV	Incident ISV (IT Service Management)
SMIT	Incident Template	Incident Template (IT Service Mgmt.)
SMIV	Incident (VAR)	Incident VAR (IT Service Management)
SMMJ	Normal Change	Normal Change with TMS
SMMM	Maintenance Cycle ()	Alternative,for Task List Variant SAP1
SMMN	Maintenance Cycle	Standard,for Task List Variant SAP0
SMOR	Monitoring Req.	Monitoring Requirement
SMOT	Operations Task	Service Operations Task
SMPR	Problem	Problem (IT Service Management)
SMPT	Problem Template	Problem Template (IT Service Management)
SMQC	QGM: Change	Quality Gate Change Managment: Change
SMQU	QGM: Urgent Change	Quality Gate Managment: Urgent Change
SMRQ	Service Request	Service Request (IT Service Management)
SMRT	Service Req Template	Service Req Template (IT Service Mgmt.)
SMSO	ITSM Service Order	ITSM Service Order
SMTB	TBOM Recording	TBOM Recording
SMTM	Defect Correction	Correction of a defect, during test
SNWI	Incident (NWS)	Incident (NWS)
SNWS	Support Notification	Support Desk Message NWS

Figure 20: ITSM Transaction Types

For each transaction types, the available statuses and corresponding workflows (to transition between different statuses) need configuring. As an example, following is the available status configured for incident message type:

User Status		
Stat...	Status	Short Text
	IRTE	IRT Exceeded
	IRTW	IRT Warning
	MPTE	MPT Exceeded
	MPTW	MPT Warning
10	NEW	New
15	WTDR	Withdrawn
20	PROC	In Process
21	SAP1	Sent to SAP
25	DSPT	Forwarded
30	CACT	Customer Action
50	SPRV	Proposed Solution
60	CONF	Confirmed

Figure 21: Incident Statuses

6.2.2 Master Data Configuration

For ITSM Scenarios, many types of master data need to be created and maintained, including business partners, organizational structure, installed base, and number range. The installed base master data defines a product hierarchy for service in which SAP Solution Manager will assign a subcategory and products. The business partners in SAP Solution Manager were defined in the form of the support team, internal employees, and key users.

The organizational model of BPS Support Team has been defined as follow:

Assignment Plan (CRM)	Code	ID	Business partner
Service Provider	CCC	O 50000607	0000000144
Service Desk	ServiceDesk	O 50000608	0000000145
Service Manager	SrvcManager	S 50000614	
1st Level Support	1stLevel	O 50000609	0000000146
1st Level Support Employee	1stLevelEm	S 50000615	
2nd Level Support	2ndLevel	O 50000610	0000000147
BC-Team	BC	O 50000611	0000000148
BC-Team Employee	BCEmployee	S 50000616	
CRM-Team	CRM	O 50000612	0000000149
CRM-Team Employee	CRMEmployee	S 50000617	
Sales	Sales	O 50000613	0000000150

Figure 22: ITSM Organizational Model

Number ranges are used to numerically classify ITSM documents. After one of the documents (of a specific type) is created, SAP Solution Manager will assign a number within the specified range to that document. Table 9 summarizes the configured number ranges:

Transaction Types	Number Range
Incident	1000000000 – 1999999999
Service Request	2000000000 – 2999999999
Problem	3000000000 – 3999999999
Knowledge Article	4000000000 – 4999999999

Table 9: ITSM Number Ranges

6.2.3 SLA Configuration

For SLA escalation, the service profile and the response profile need configuring. The service availability of BPS Support is defined in the service profile as 8/5 (8 hours per day / 5 days per week). Depending on the Category and Priority level, different IRP and MPT were defined in the response profile.

The Service Desk ticket impact and urgency levels were configured as follow:

Define Impact

Impact	Description
1	Disaster
25	High
50	Medium
75	Low
99	None

Define Urgency

Urgency	Description
1	Emergency
25	Very High
50	High
75	Medium
99	Low

Figure 23: ITSM Ticket Impact and Urgency Definition

Per the impact and the urgency, the recommended priority is defined as being illustrated in the image on the next page. The recommended priority will be presented to end-user after they choose the impact and urgency, however, the end-users can choose from any of the predefined priorities (Very High, High, Medium, and Low).

Maintain Recommended Priority				
	Urgency	Impact	Prio.	Description
	1	1	1	1: Very High
	1	25	1	1: Very High
	1	50	2	2: High
	1	75	2	2: High
	1	99	3	3: Medium
	25	1	1	1: Very High
	25	25	2	2: High
	25	50	3	3: Medium
	25	75	3	3: Medium
	25	99	4	4: Low
	50	1	1	1: Very High
	50	25	2	2: High
	50	50	3	3: Medium
	50	75	4	4: Low
	50	99	4	4: Low
	75	1	1	1: Very High
	75	25	2	2: High
	75	50	3	3: Medium
	75	75	4	4: Low
	75	99	4	4: Low
	99	1	2	2: High
	99	25	3	3: Medium
	99	50	3	3: Medium
	99	75	4	4: Low
	99	99	4	4: Low

Figure 24: ITSM Ticket Recommended Priority

After all the activities of ITSM configuration had been performed, the authorization roles were configured and assigned to relevant users. Being used to implement the security concept, the authorization roles enable users to perform only the activities required by the users to complete their required job duties, following the principle of least privilege.

The dispatching of ITSM ticket to the Support Message has been automated by configuring the workflow and dispatching roles based on the involved component (e.g. general issues or specific software component-related issues).

6.3 User Interface

The interface of ITSM Application is called SAP CRM Web UI, which offers a web-based interface. To access any functions from this interface, business roles need developing and assigning to corresponding users (or user groups). After those roles are assigned to correct users, the users will be able to view the features and functions that are unique to their roles. Being derived from the set of roles from service design, the following business roles were developed: ITSM Requester, ITSM Dispatcher and ITSM Processor.

Accordingly, the user with ITSM Requester business role assigned will have the options to create incidents and service requests from the Web UI home screen. For incident management and service requests, we decided to create a guided procedure, or wizard, to help users to insert mandatory fields as creating service requests. Each step of the guided procedure is structured to give the requesters a limit number of fields available to submit the request. For example, the requester can only be allowed to input the impact and urgency of the incident, but not the priority as this information needs specifying by the dispatcher. The home page of ITSM Message Requester is presented in Figure 25:

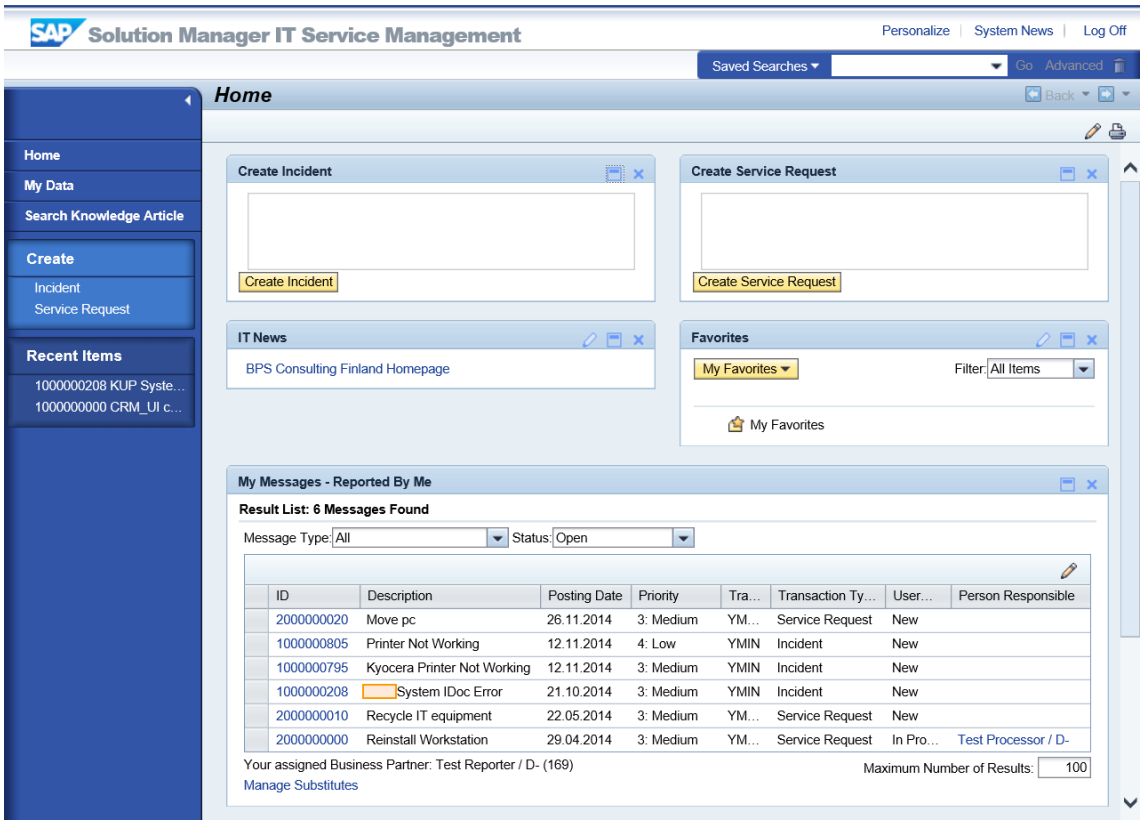


Figure 25: ITSM Requester Home Page

6.3.1 Create Incident

In order to create an incident ticket, reporters first need to enter the incident descriptions details, including the incidents' titles, impact, urgency, and optionally, the detailed description and the preferred contact person.

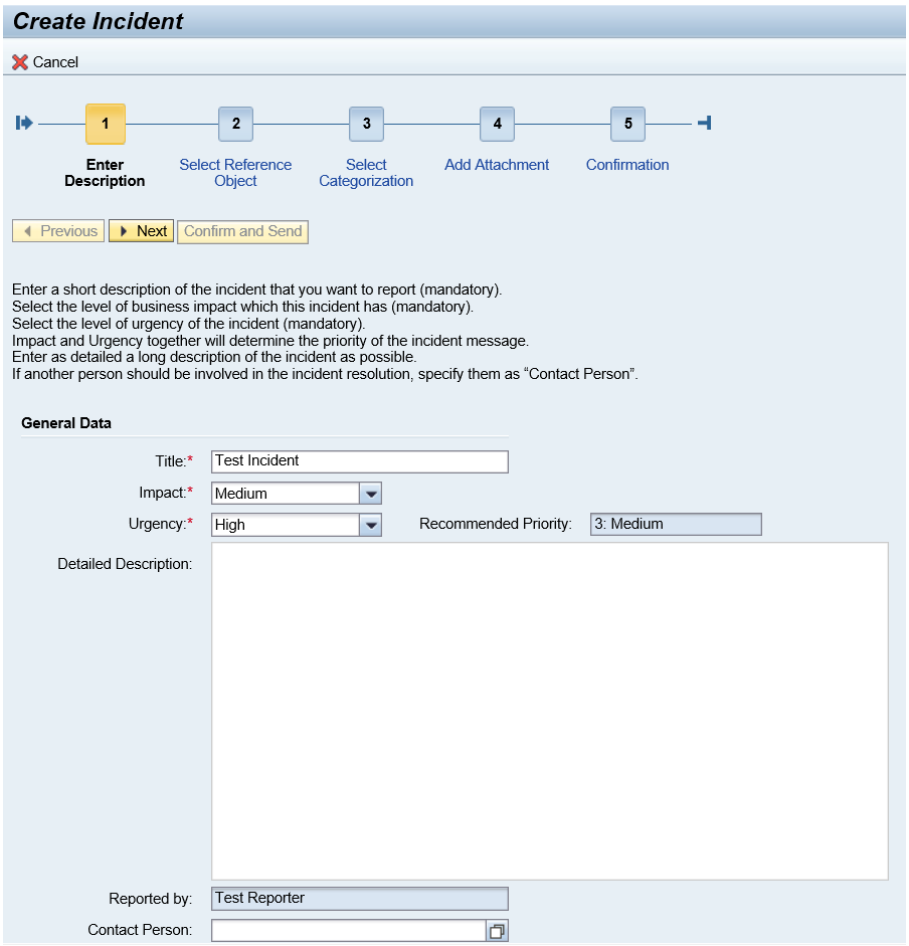


Figure 26: Reporter UI - Enter Description

Then, the reporter can enter the incident categorization. The categorization of incident is structured in a hierarchy and customized during the configuration steps

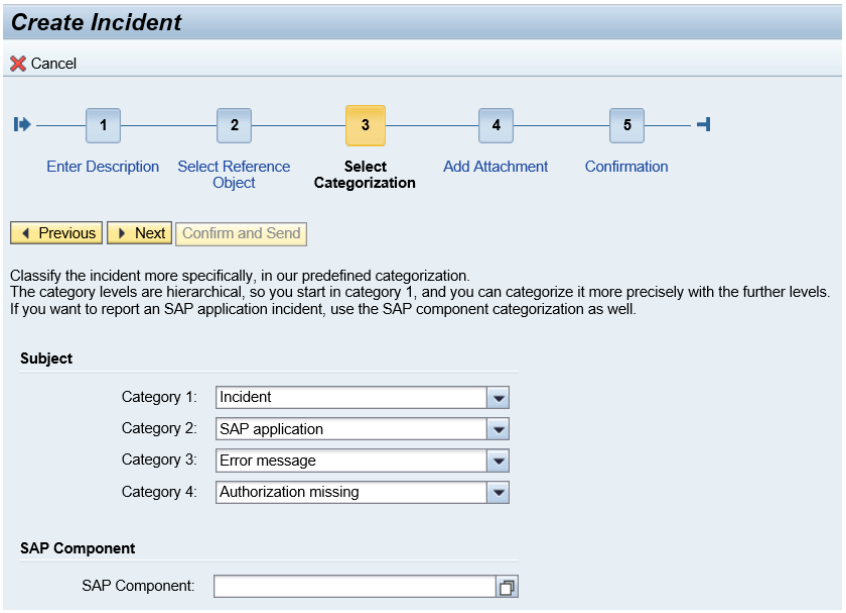


Figure 27: Reporter UI – Select Categorization

The reporter can also add attachments such as a screenshot of the incident or include the URL of the application in question on the "Add Attachment".

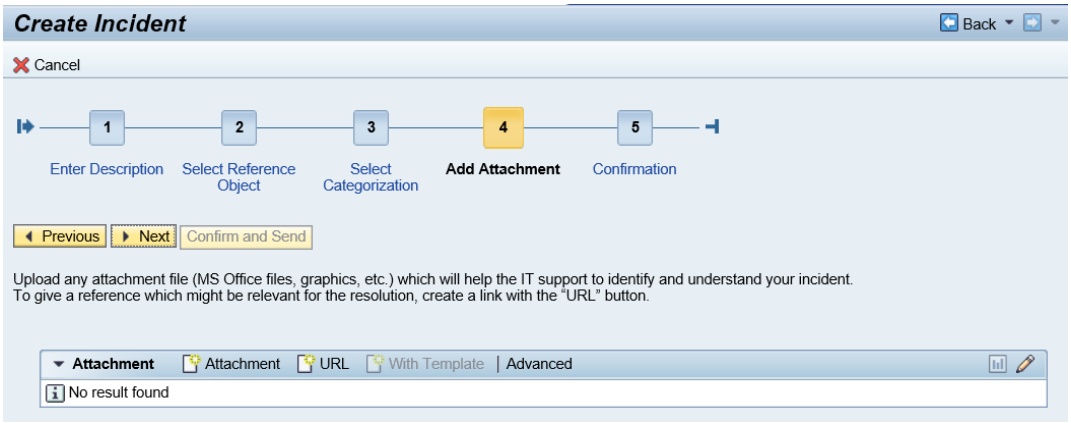


Figure 28: Reporter UI – Add Attachment

Finally, the reporter can review the details of the incident before sending the ticket to BPS Support Desk.

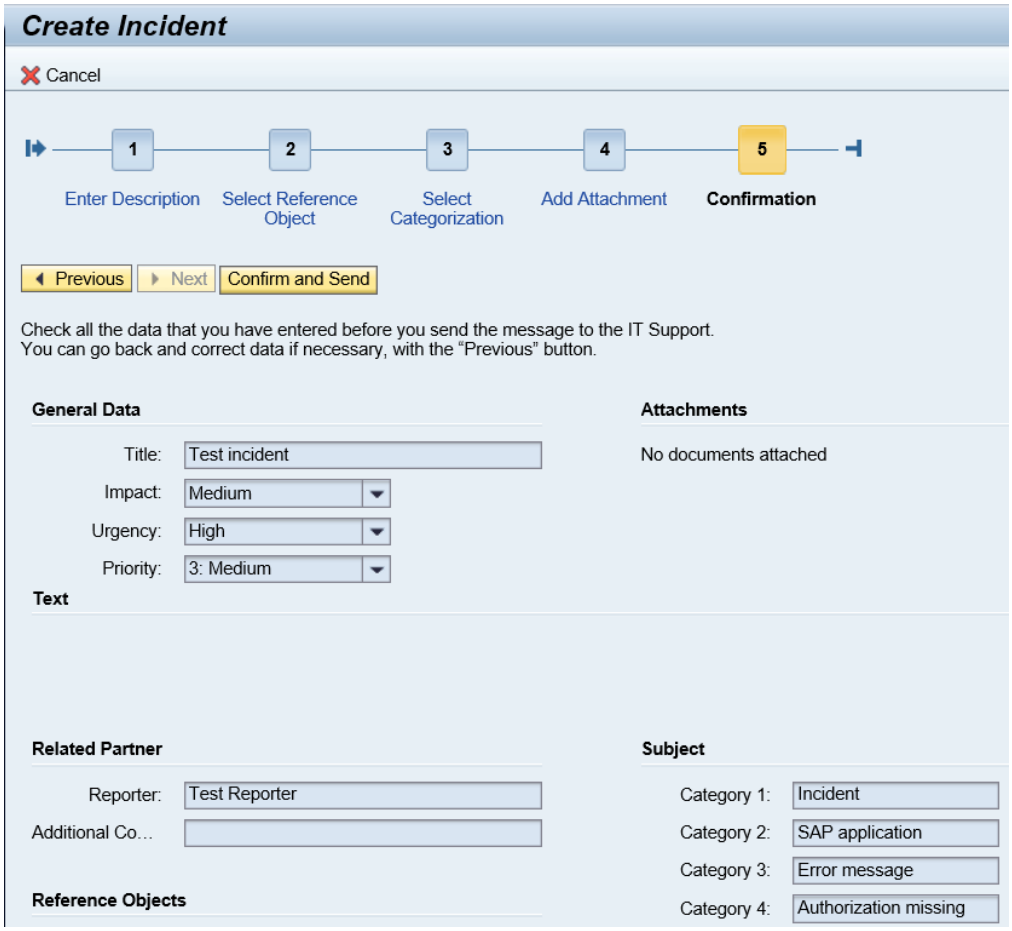


Figure 29: Reporter UI - Confirmation

After the creation of the incident ticket, the reporter can view the incident status on the home page, section "My Message – Reported by Me", message type "Incidents":

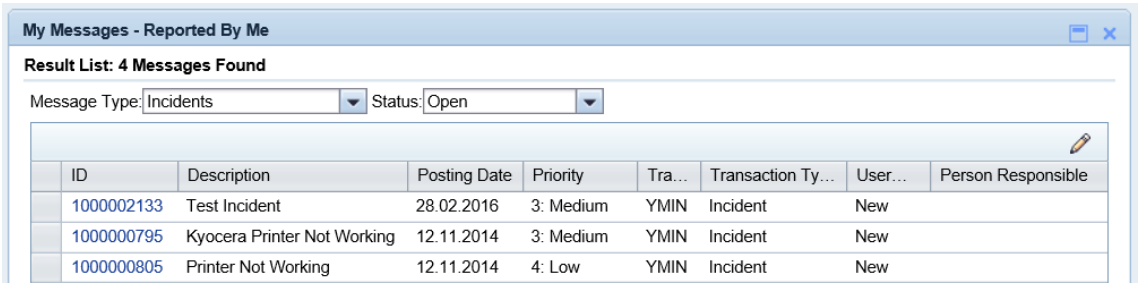


Figure 30: Reporter UI - Incident Status

6.3.2 Create Service Request

Similar to the creation of an incident ticket, a requester can create a service request with a guided procedure. As it can be seen on the next screenshot, the requester can choose from "Top Service Request" some common request, these request types have been configured so

that some of the request details have been prefilled (such as the request's categorization) to minimize the input from the users.

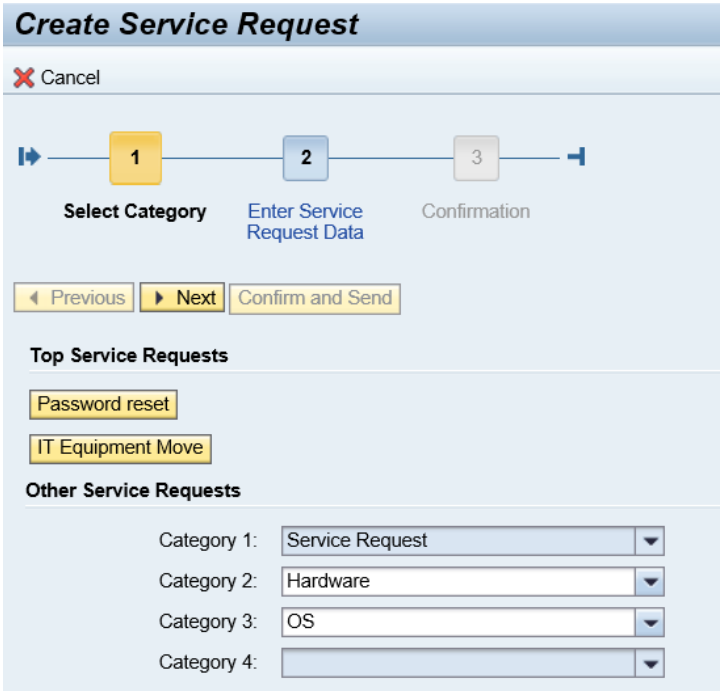


Figure 31: Requester UI - Select Category

After having chosen the request category, the user can enter the detailed description of the request on "Enter Service Request Data":

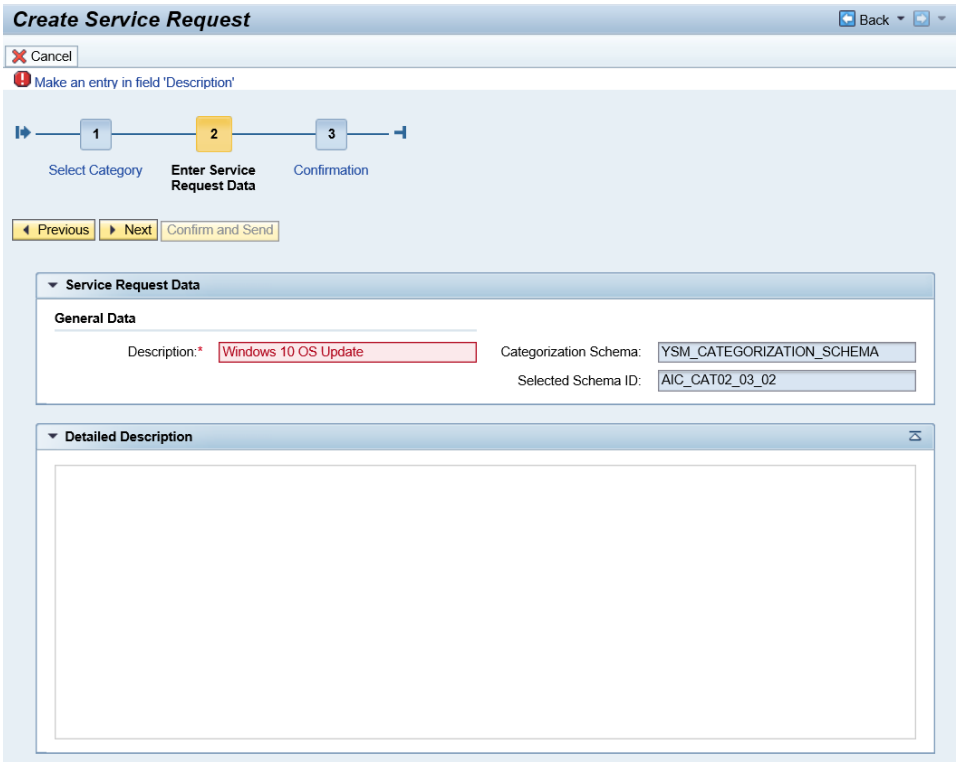


Figure 32: Requester UI - Enter Service Request Data

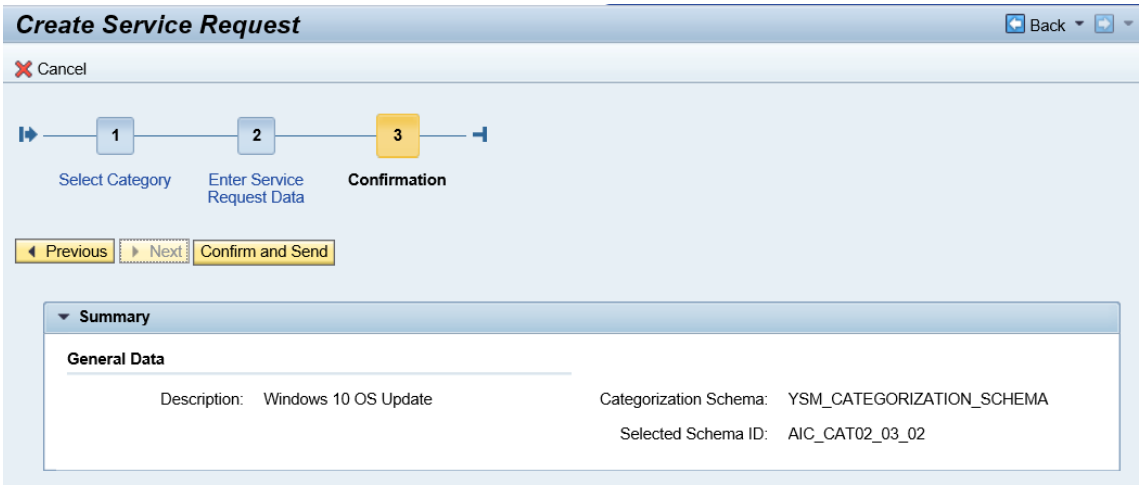


Figure 33: Requester UI - Confirmation

After the creation of the service request, the reporter can view the fulfillment progress on the home page, section “My Message – Reported by Me”, message type “Service Requests”:

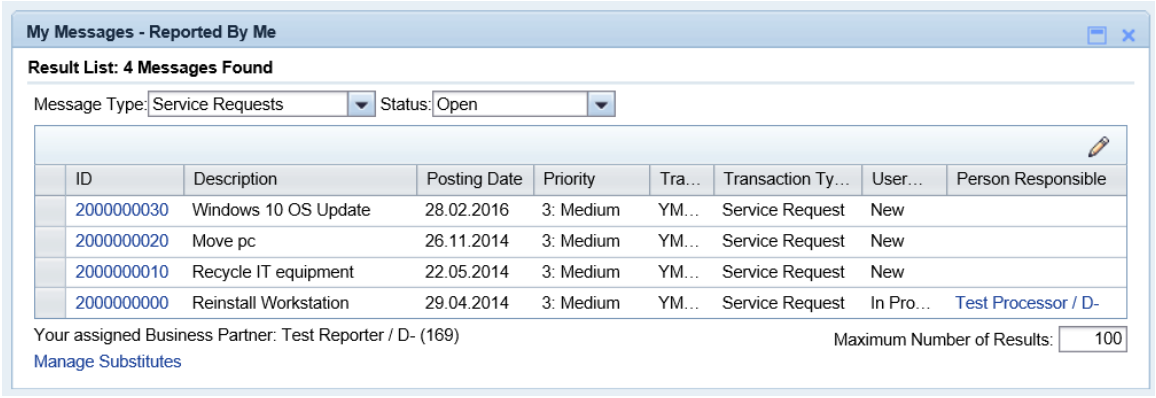


Figure 34: Requester UI - Service Request Status

6.3.3 Dispatch Incident / Service Request

The home page of ITSM Message Dispatcher is presented on Figure 35:

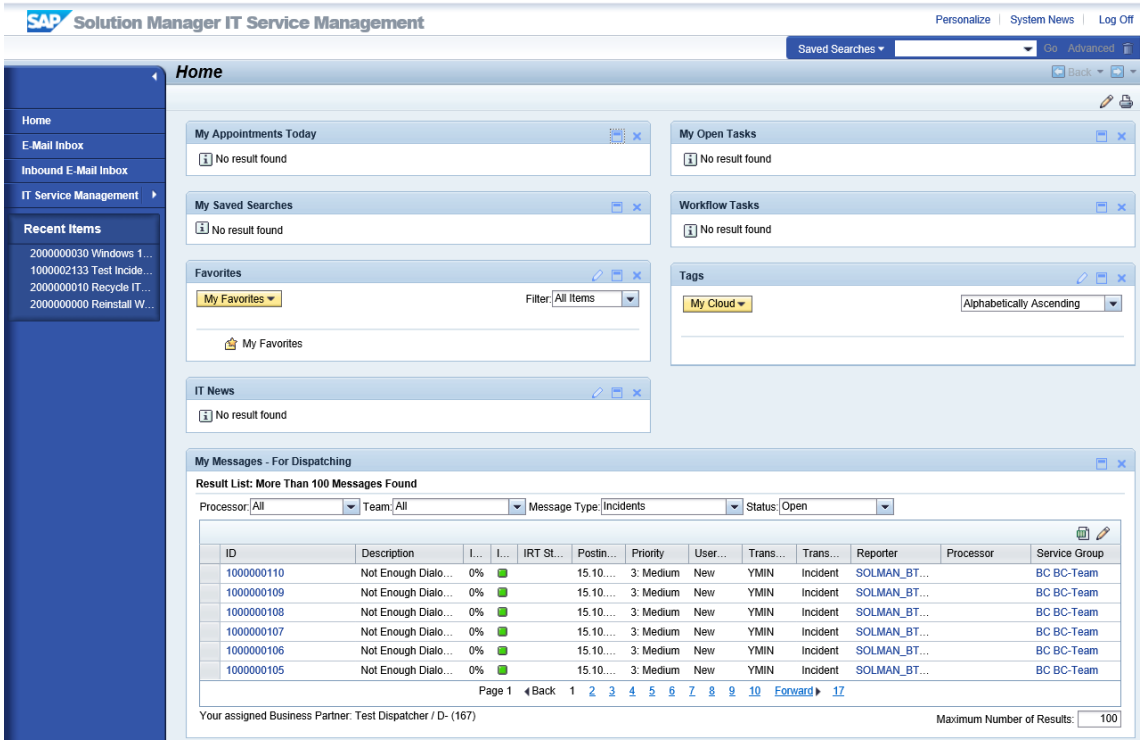


Figure 35: ITSM Dispatcher Home Page

As it can be seen from the above screenshot, the dispatcher can view the open ticket ready to be dispatched from the home page. Alternatively, he or she can search for the ticket as being illustrated on Figure 36 and Figure 37:

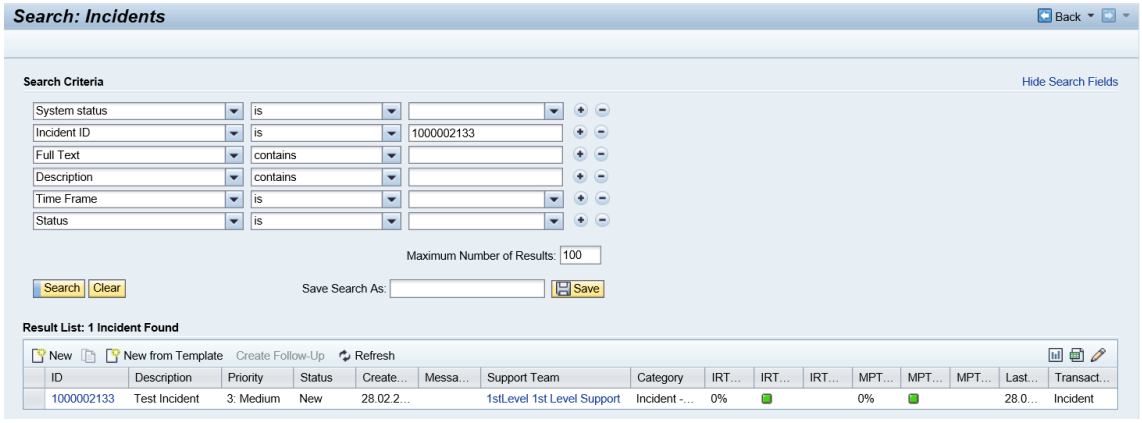


Figure 36: Dispatcher UI - Search for Incidents

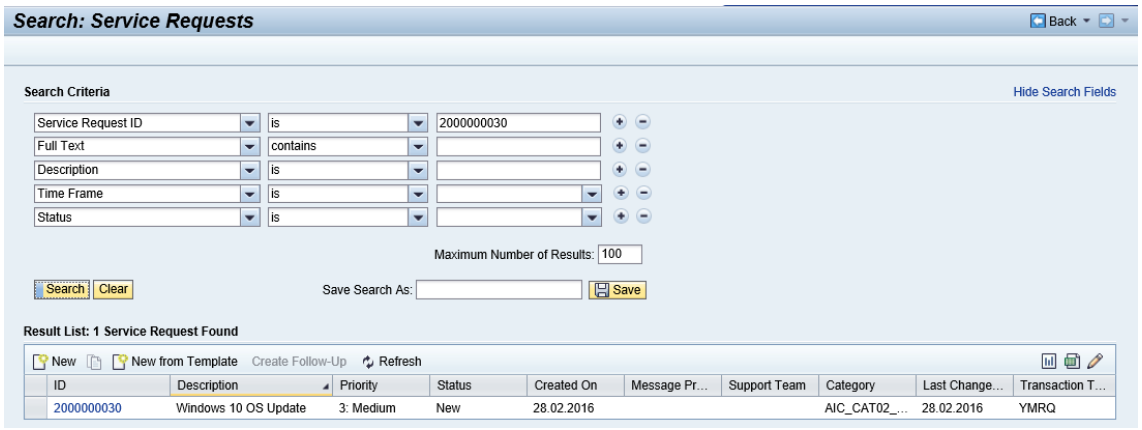


Figure 37: Dispatcher UI - Search for Service Requests

The workflow rules have been configured to determine the next processor of the ticket. However, the dispatcher can modify the appropriate processor when needed, for example, in the case the processor automatically determined by the system is not available, the dispatcher can dispatch the ticket to another available processor.

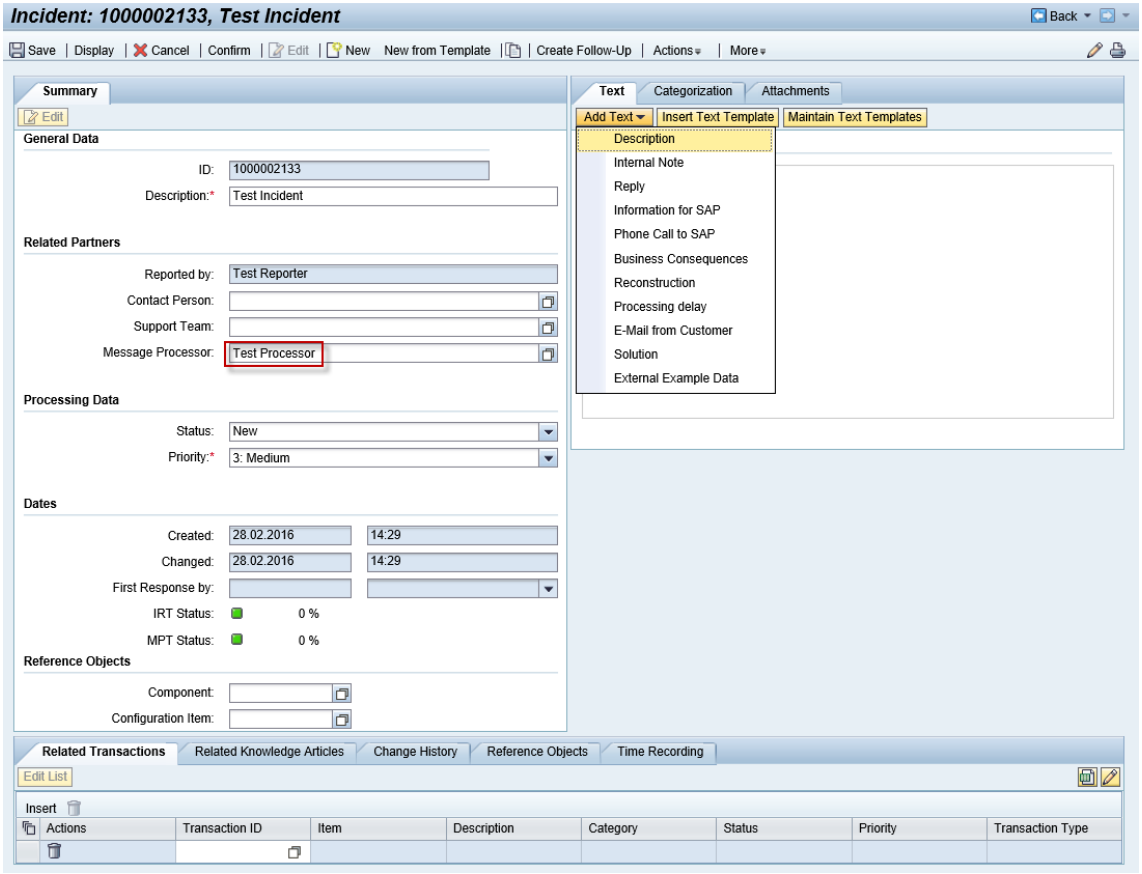


Figure 38: Dispatcher UI - Process Incident Interface

The interface for ITSM Dispatcher also provides links for message dispatchers to create incident tickets and service requests, as well as functions to process messages, create follow-ups, and add some information to the documents created by the requesters.

6.3.4 Process Incident

The home page of ITSM Message Processor is illustrated in Figure 39:

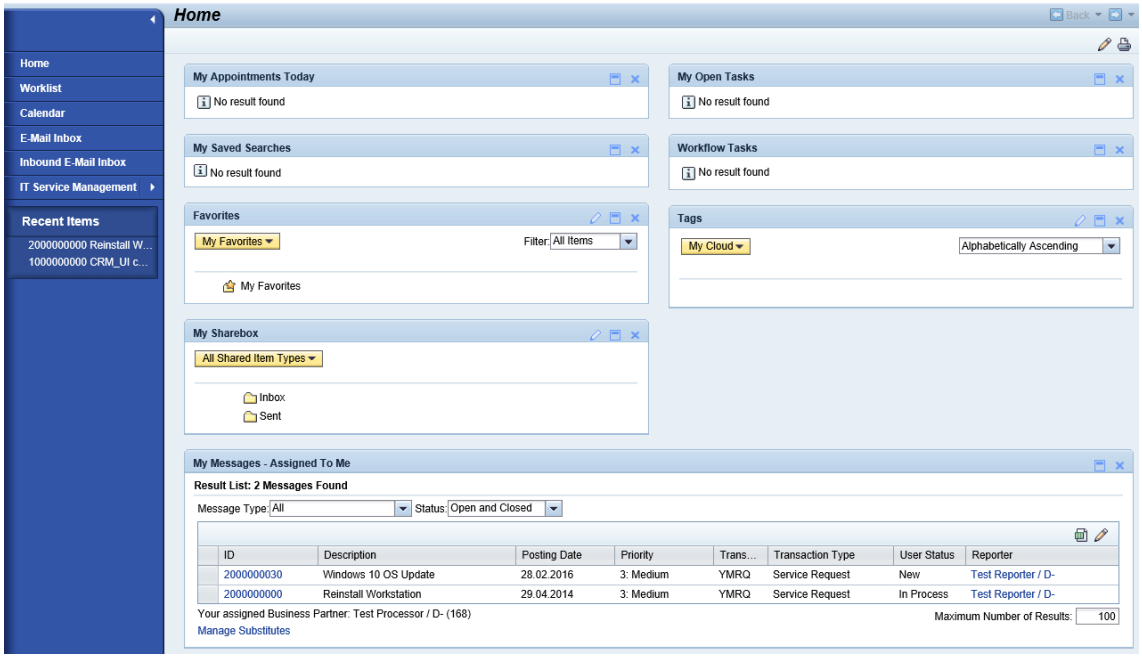


Figure 39: ITSM Processor Interface

As being seen from the above screenshot, the ITSM processors can view all the ticket assigned to them directly from their ITSM homepage. After having clicked on the ticket number, the processor can then start to process the ticket, to fill in additional details such as internal notes, or to dispatch the ticket to another processor or directly to SAP Global Support.

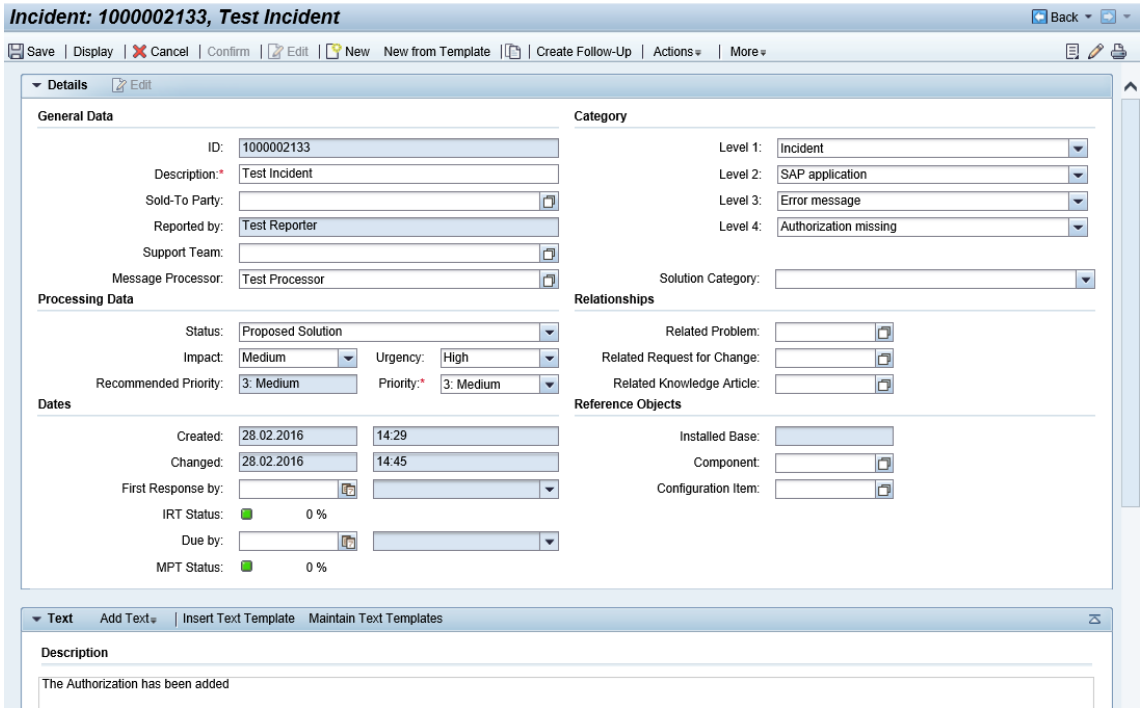


Figure 40: Processor UI - Process Incident Interface

After the solution to an incident was found, or the service request has been fulfilled, the ticket can be sent back to the ticket reporter for approval by changing the ticket's status to "Proposed Solution"

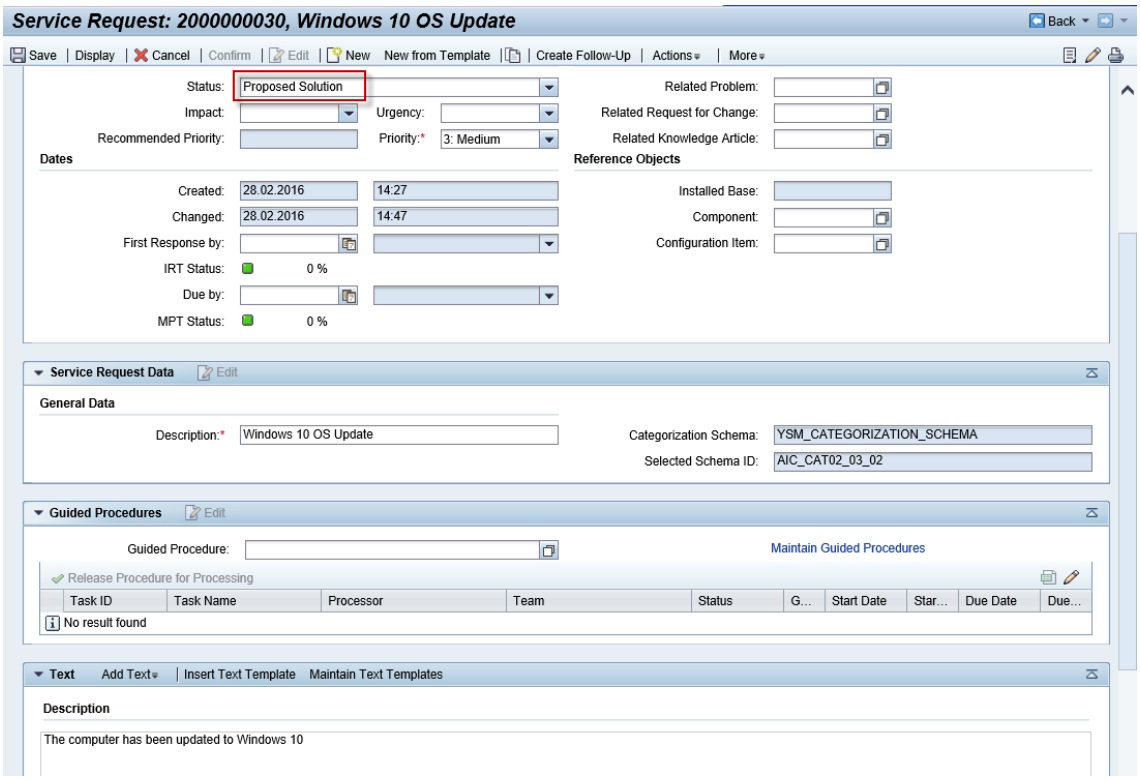


Figure 41: Processor UI - Propose Solution

6.3.5 Close Incident

At any time, the reporters can check the status of ticket processing from their ITSM Home Page. After the proposed solution is suggested, the reporter can accept the solution and close the ticket, or may request a rework instead. If the ticket is confirmed, it is closed and cannot be modified anymore. However, one worth-mentioning point is that when a ticket is closed, it can still be grouped by ITSM processor when creating problem message.

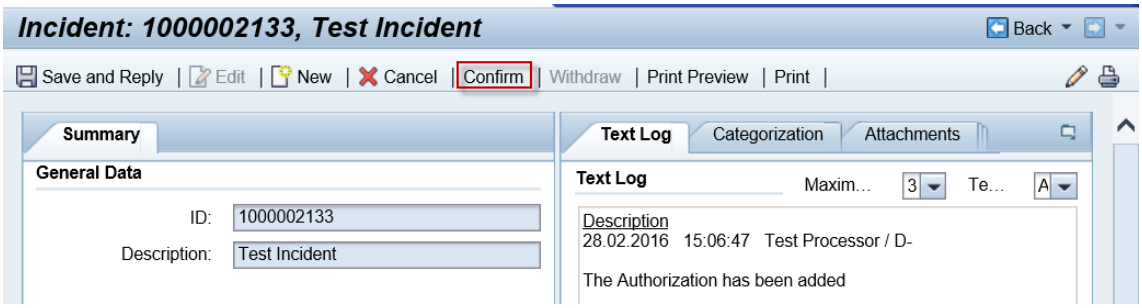


Figure 42: Reporter UI - Close Service Desk Ticket

We customize the Web UI interface so that the screen layout for each ITSM functions is global for the assigned user (or user groups). The users also have the capabilities to personalize the default screens to create views and layouts according to their own preferences. However, with these personalization capabilities, all the changes made by the users, it does not affect the layout or view of any other users with access to the same information.

Each business role will have access to a set of pages containing a set of shortcuts and providing access to the components related to a specific scenario (such as Incident Management, or Change Management). Each set of pages is grouped in what is called Work Center. These pages contain links, data, search areas, and reports depending on what activities you're processing within that particular ITSM scenario.

7 System Operation and Future Development

After the production system was in operation, two user training sessions were performed for BPS internal employees.

The systems performance does not need monitoring frequently due to many reasons. Firstly, the number of end-users is quite small, because in the beginning, only BPS internal employees can use and access the ITSM Service Desk. Secondly, the Solution Manager systems do not contain and process many business transactions as other systems, such as ERP or CRM, and therefore, the performance is not a big issue. Thirdly, the systems were installed on a separated physical machine so their resource consumption will not interfere with other systems in our technical landscape.

In other to ease the system training and support the system operation, all the produced documentation and training materials were stored in a Microsoft SharePoint site and shared with BPS employees. The documentation includes, for example, system landscape documentation, process modeling, configuration notes, system backup and recovery documentation…

In terms of backup and recovery, in order to recover the system after possible system failures, such as system crash or loss of data, the database backup background jobs were scheduled to run automatically. For the production Solution Manager system, database backup is performed every week, the transaction log backup was scheduled to run every 2 hours. Every year, we take a system snapshot and backup the virtual hard disks to an external hard-drive.

For future development, one idea is to integrate ITSM and Service Desk tools with Project Management and Change Management, the two other related components of SAP Solution Manager. With these two components, integrated and streamlined End-to-End processes from project planning, services support and change request fulfillment can help BPS further improve their services and centralize documentation to provide a “Single Source of Truth” across the company.

8 Conclusion

It is discovered later in the project that the integration with Microsoft Outlook is not working as expected, so the email inbound channel for creating ITSM tickets was not enabled. Therefore, at the moment, the end-users can only create incidents in the service desk portal. In general, all the system requirements discussed at the beginning of the project have been fulfilled, the new solution has been deployed and tested, user training sessions have been held, all the documentation has been finalized and stored in a network-shared folder. Based on the deliverables of service design and system analysis, the system installation and configuration activities have been performed relatively fast (about 2 weeks in total) and the final solution is considered to be useful by the project stakeholders. In general, the provided solution has introduced both new tools and best practices to help BPS support employees manage service desk tickets effectively. With Solution Manager reporting capabilities, BPS Consulting Finland Oy managers can also determine options to improve the support processes further and increase customers’ satisfaction.

References

Hana, A. & Rance, S. 2011. ITIL® glossary and abbreviations. Accessed 30 February 2015. https://www.axelos.com/Corporate/media/Files/Glossaries/ITIL_2011_Glossary_GB-v1-0.pdf

Moritz, S. 2005. Service Design – Practical Access to an Evolving Field.

SAP Application Incident Management White Paper. 2011. Accessed 15 March 2015. https://support.sap.com/content/dam/library/SAP%20Support%20Portal/support-programs-services/solution-manager/processes/External%20Resource%20Container/SAP%20ITSM%20WIKI%20page%20content/ITSM%20Information%20and%20Overview/Whitepaper/Application_Incident_Management_Whitepaper.pdf

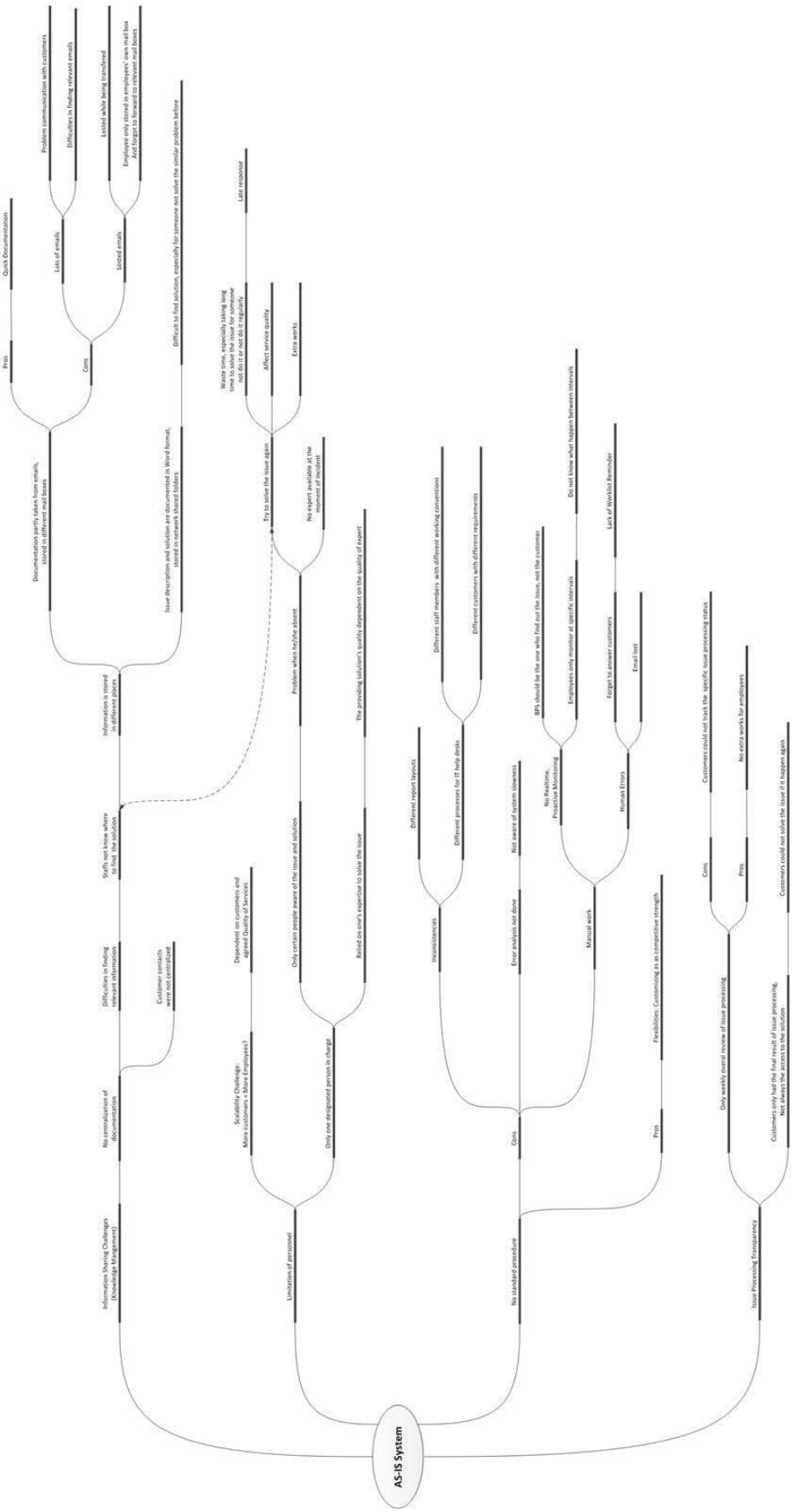
Williams, N. 2013. IT Service Management in SAP Solution Manager. SAP Press

Figures

Tables

Appendixes

Appendix 1: Brainstorming Mind-Map

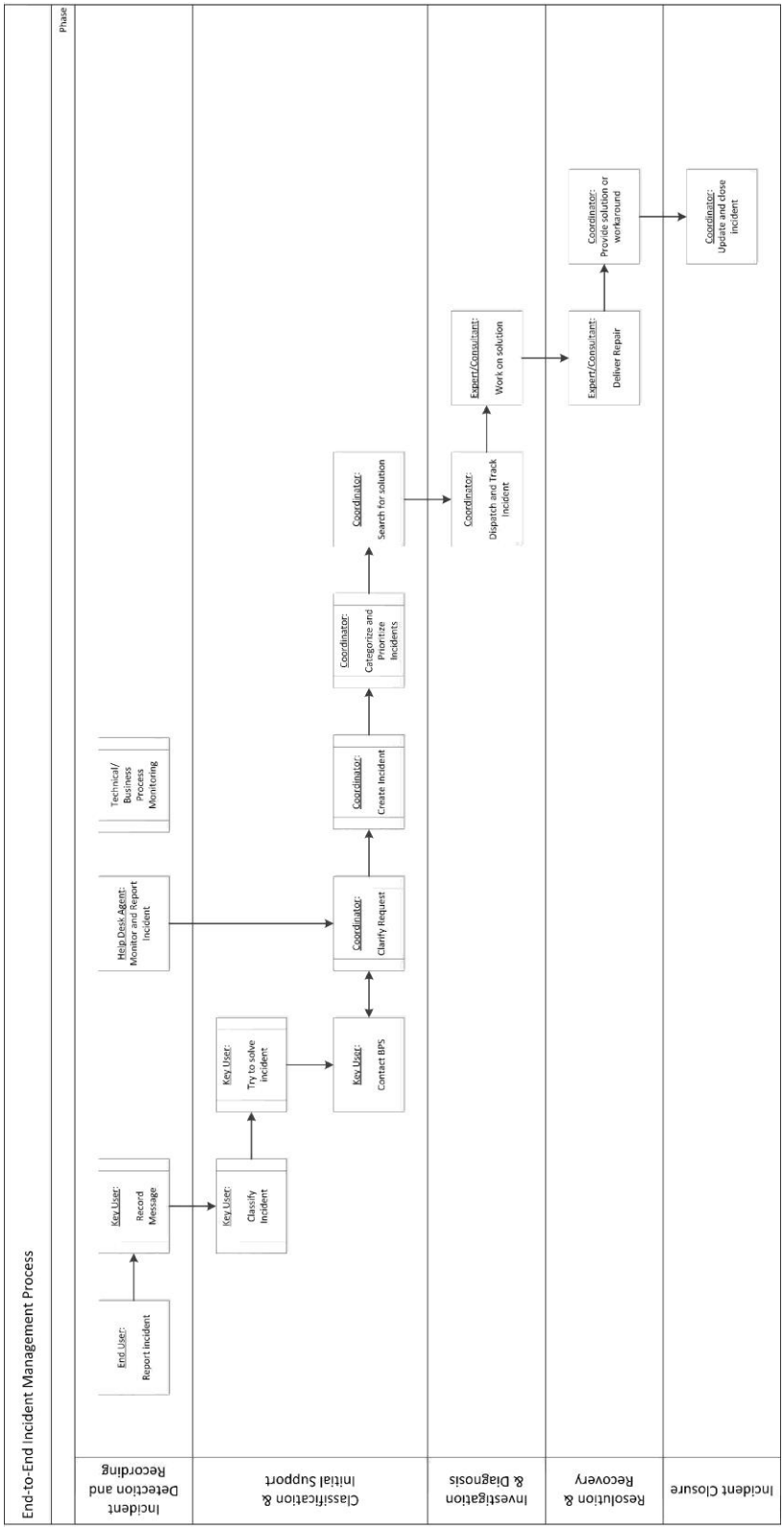


Appendix 2: SWOT Analysis Summary

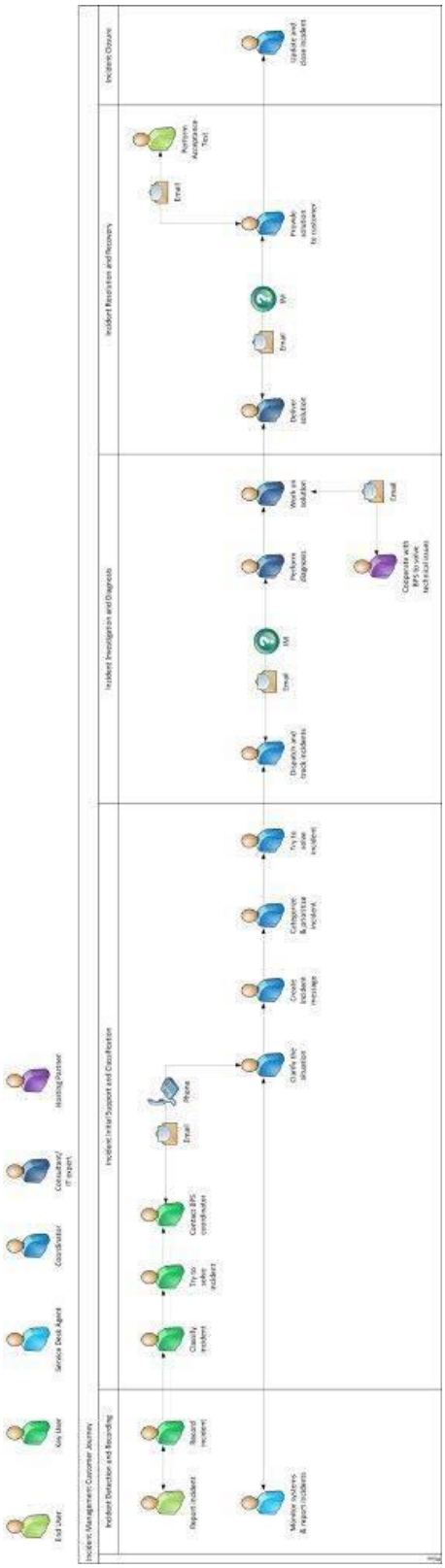
	Strengths		Weaknesses	
	BPS As is situation	Solman To be situation	BPS As is situation	Solman To be situation
External: customers, vendors, services, stakeholders	Custome familiar with current processes The current support model is tailored to each customer's specific needs	Customer can receive better support service from BPS Customer can track the status of service request	Customer mayexperience low response to incidents Customer do not know the status of service request No error documentation done or followed montly	Customer need to learn about the new service and may need to change their working convention
Internal: usability, overall control, functionality	Staffs familiar with current working convention	Staffs can deal with incident faster, more efficientlywith support from ITSM control and support tools	Staffs mayresponse to incident slowlydue to the lack of documentation and support tool Information about message processing is difficult to be shared	BPS Support staff mayneed to learn about the new tool
Technical status	No need for further configuration	SolMan already installed, basic configuration in place ITSM will help to automate some support functions	Manyjobs still performed manually, without automation tools	Need time and configuration effort to implement the new system
Financial status	No further investment required	No further investment in term of license require	Incident that cannot be dealt with efficientlyor satisfy customers can cost the companysupport expense, reputation	Mayneed to invest in new hardware
General: Quality, reliability, lifetime, scope	The scope of support function was defined and in used	It is the future direction, SAP is investing to make SAP Solution Manager a central tool to manage its system landscape and provide support to customers	Lots of manual work. Even though it's working well now, if the customer base of BPS Consulting Finland Oy expand in the future, it can become harder to manage and improve customer support services.	Need to expand the scope of the support function
Future development possibilities		Can expand the application incident management to other scenarios such as Change Request Management, Configuration Management... with SAP-standardized support processes in SolMan	Can only improve the support process with manual business process redesign	

	Opportunities		Threats	
	BPS As is situation	Solman To be situation	BPS As is situation	Solman To be situation
External: customers, vendors, services, stakeholders	Can continue to comply with customer working convention	Customer's satisfication can be improve Message processing can be documented and reported centralywith an automated tool	Customer mayloose trust if the incidentservice is not dealt with efficiently and in time	Maycontradict with customer's policy, working convention The service might be complicated to work with at first BPS Support staff maynot be ready to use the new system
Internal: usability, overall control, functionality		Better overal control over the support process To sell the solution to customers in the future		New system require training and education Employee's resistence to change The company commitment to change the current services Time and effortsneeded to configure the system can be an obstacle for the project success
Technical		Better integration of technical system => improve system monitoring, incident and problem management, IT assets configuration and management...		increase technical flexibilityof the system, mayintroduce configuration flaw during the configuration process The system might not working as planned, or might require additional software to provide needed functionalities
Financial status		Can increase ROI by leveraging existing investment Can bill customer for addition service, better support		Mayincrease the cost if the new system require additional administration cost, learning period Customer may not accept to adopt the service, maybe also due to the introduction of new service fee
General: Quality, reliability, lifetime, scope		The support quality, reliability will be improved when ITSM in place and staffs get to know how to use the tool	The quality, reliabilityof the service can be questioned at some points due to lack of standardized help tool	
Future development possibilities				

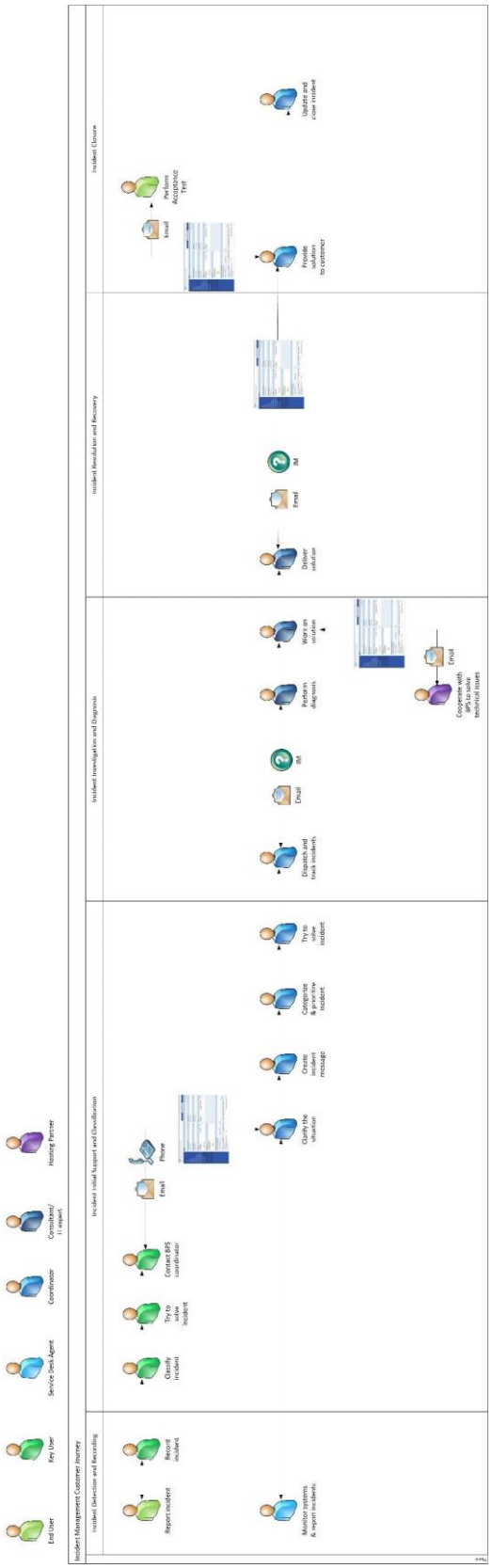
Appendix 3: End-to-End Application Incident Management Process



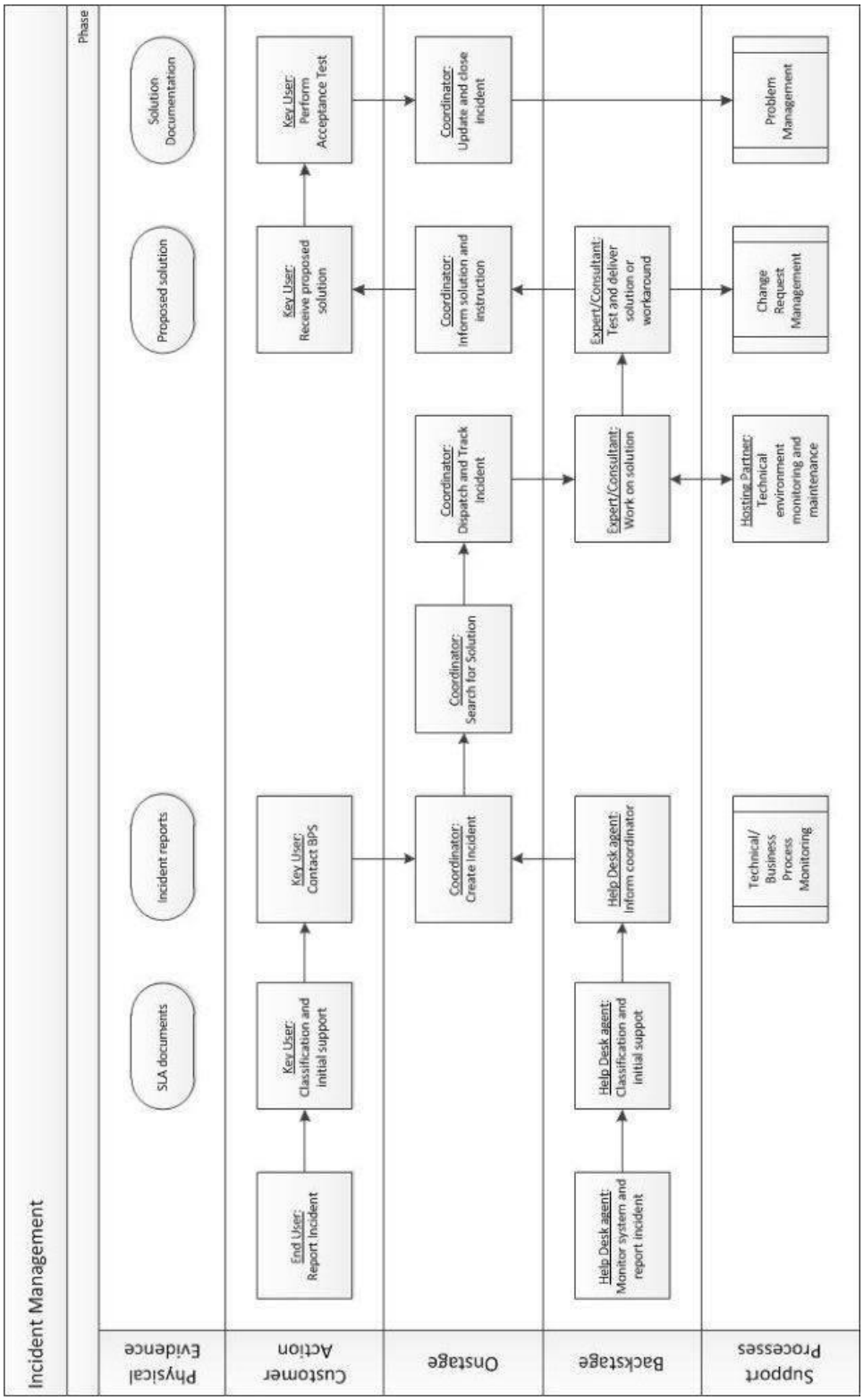
Appendix 4: AS-IS Incident Management Customer Journey



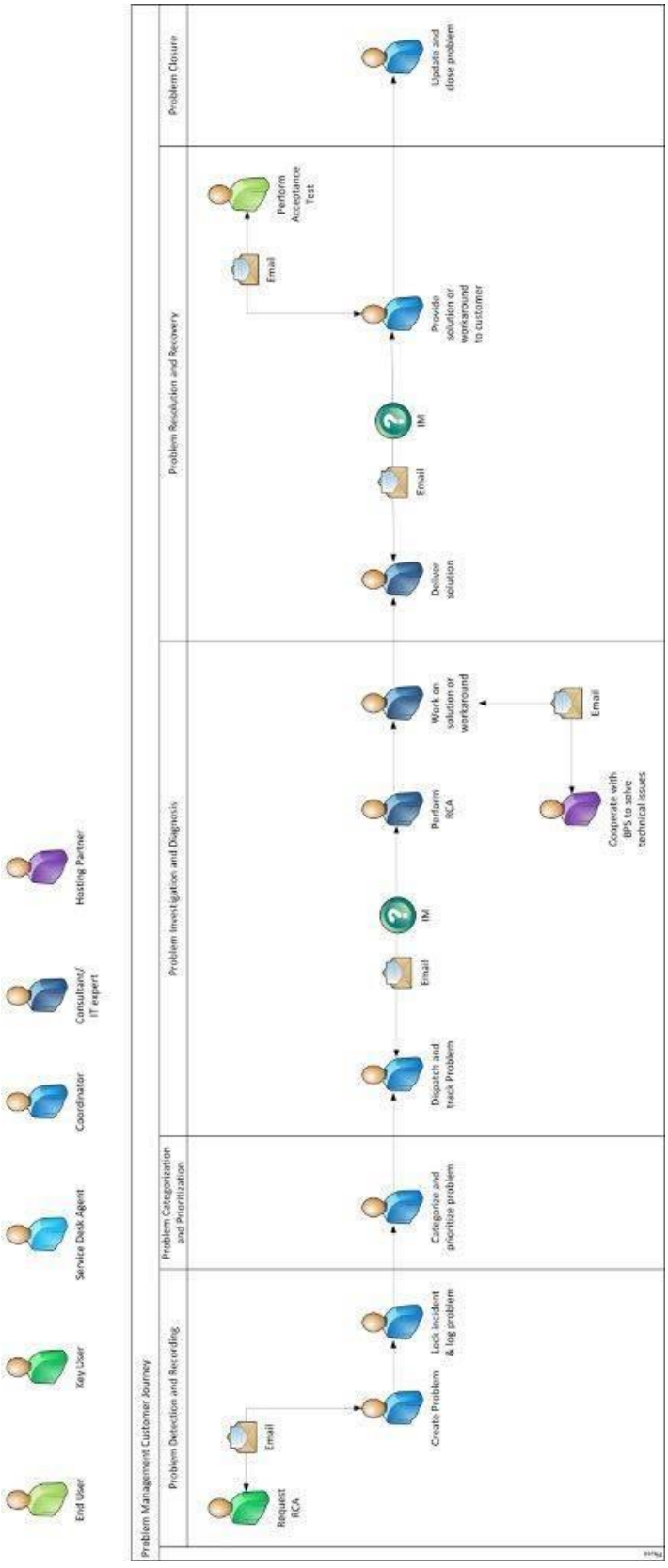
Appendix 5: TO-BE Incident Management Customer Journey



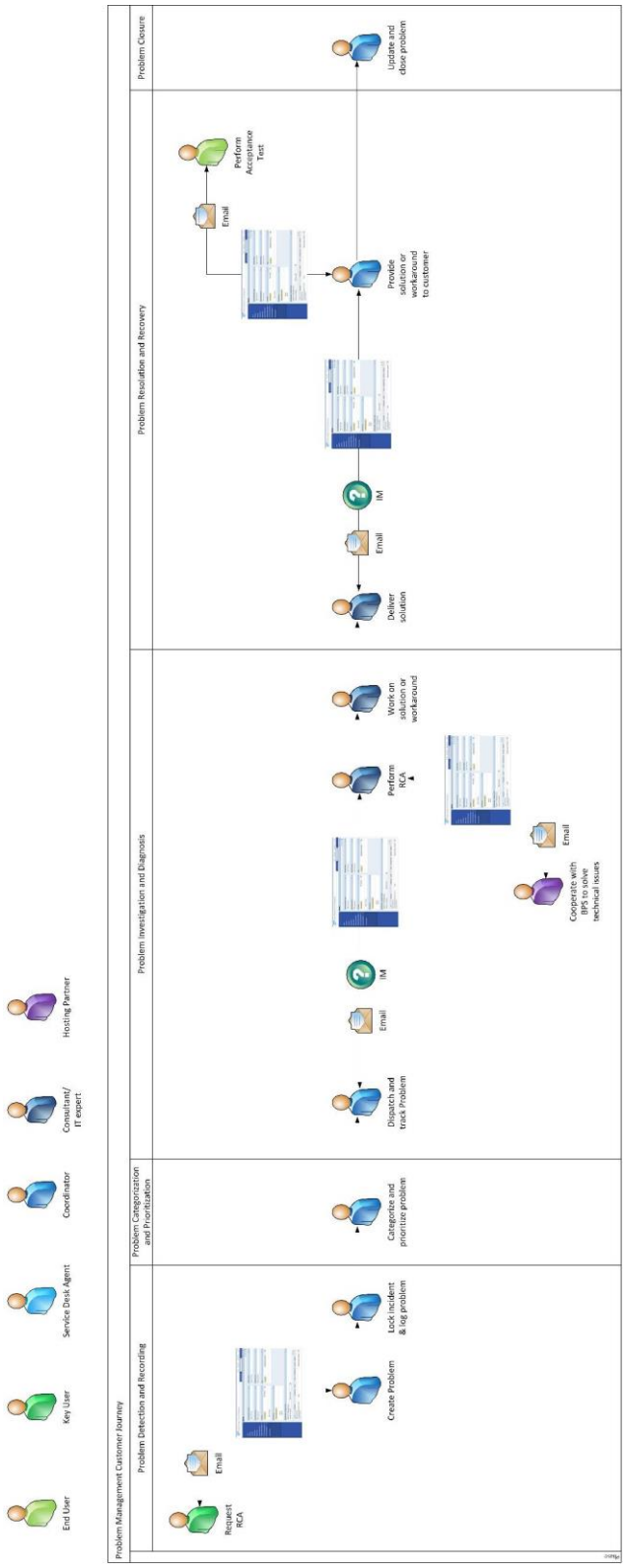
Appendix 6: Incident Management Service Blueprint



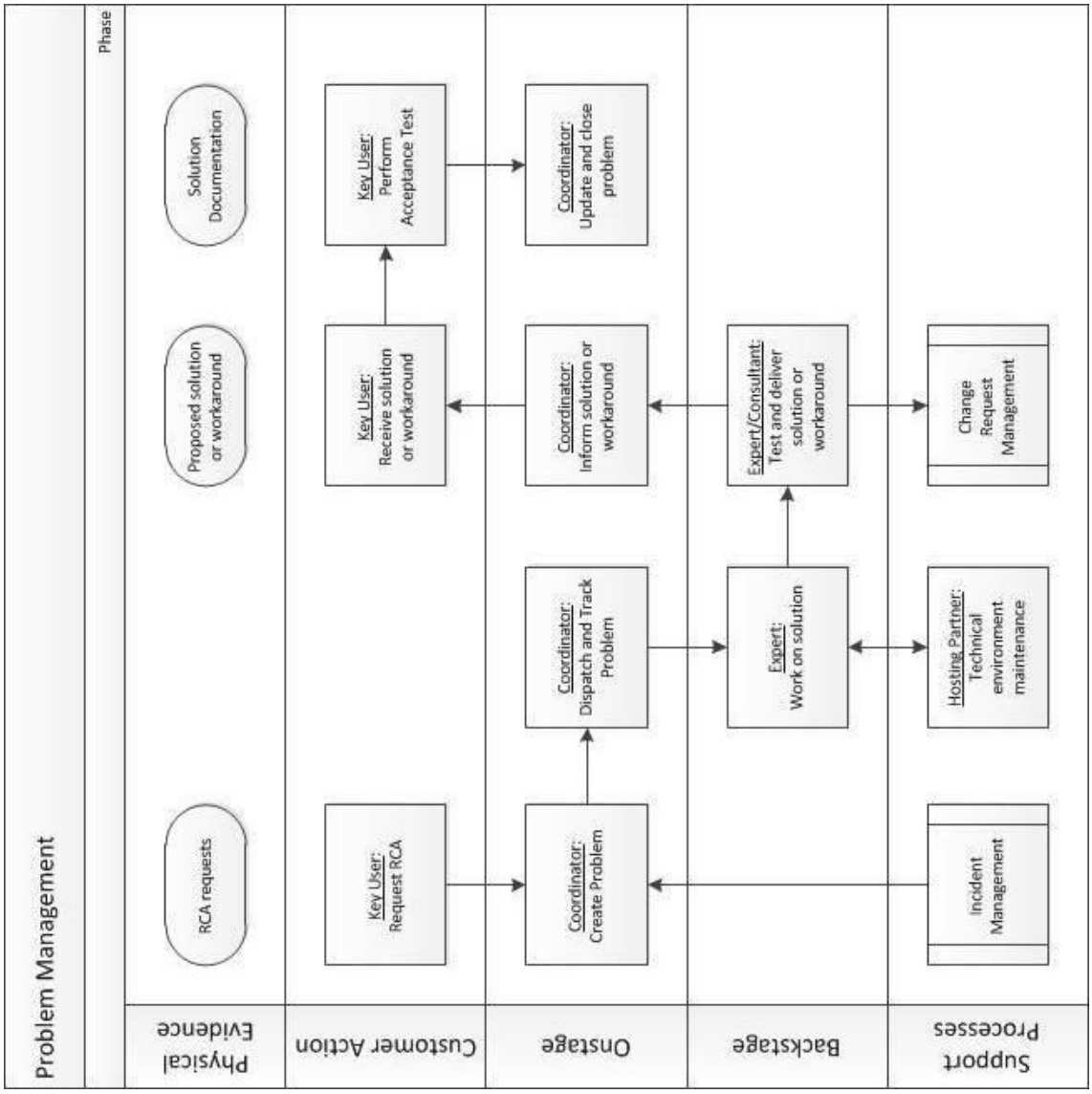
Appendix 7: AS-IS Problem Management Customer Journey



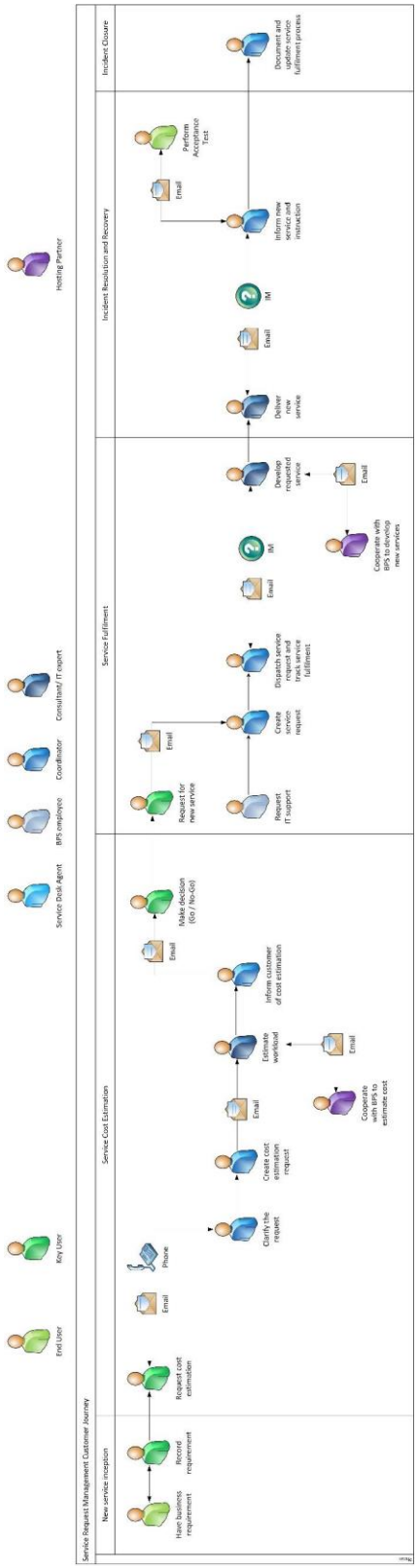
Appendix 8: TO-BE Problem Management Customer Journey



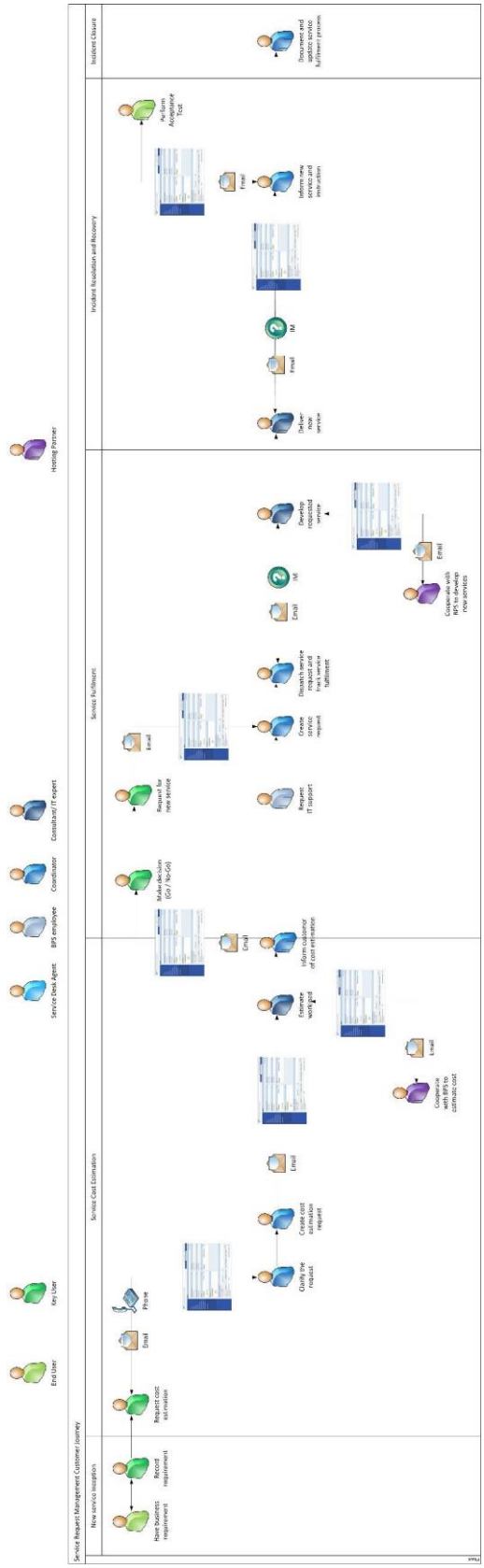
Appendix 9: Problem Management Service Blueprint



Appendix 10: AS-IS Service Request Management Customer Journey



Appendix 11: TO-BE Service Request Management Customer Journey



Appendix 12: Service Request Management Service Blueprint